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THE AMERICAN YEAR-BOOK

OF
MEDICINE AND SURGERY

BEING
A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery,
drawn from Journals, Monographs, and Text-
Books, of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED
WITH CRITICAL EDITORIAL COMMENTS

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UNDER THE GENERAL EDITORIAL CHARGE OF
GEORGE M. GOULD, M.D.

MEDICINE

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PREFACE.

SINCE issuing the YEAR-BOOK for 1899 editorial changes have been made in three departments: Dr. David Riesman has kindly consented to take entire charge of the section on Pathology, the removal of Dr. Guitéras to Havana rendering necessary his resignation as one of the editors of this department. Owing to pressure of other duties Drs. Griffin and Tillinghast have been compelled to give up the department of Materia Medica, Experimental Therapeutics, and Pharmacology. Subscribers are congratulated upon securing Dr. Reynold W. Wilcox of New York and Dr. A. A. Stevens of Philadelphia as editors. Professor Abel has also found it impossible to continue editing the section on Physiologic Chemistry, and has suggested the engagement of Dr. Reid Hunt and Dr. Walter Jones of the Johns Hopkins Medical School, and these gentlemen have accepted the appointment.

In order to make the work less tiresome to hold in reading, as well as for the convenience of specialists, the publisher has consented to issue it in two volumes, a plan that I think will be commended by all subscribers.

GEORGE M. GOULD.

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GENERAL MEDICINE.

By ALFRED STENGEL, M. D., AND D. L. EDSALL, M. D.,

OF PHILADELPHIA.

INFECTIOUS DISEASES.

GENERAL CONSIDERATIONS REGARDING INFECTIOUS DISEASES.

Surgeon-General G. M. Sternberg¹ reviews the condition of the **health of the troops** in the field and in camp during the recent hostilities. He attributes much of the illness to the reduction of the age-limit from 21 to 18 years, and the hasty way in which the volunteer regiments were necessarily organized. Many of the officers of the volunteer regiments particularly were ignorant of the principles of camp-sanitation and of other responsibilities; this added to the illness. The methods adopted in the restriction of disease and improvement of sanitary conditions are described, and the results accruing therefrom are considered entirely satisfactory. The medical reports received from May to September, from commands aggregating 167,168 men, show that 1715 deaths occurred, 640 of which were due to typhoid fever, 97 to malarial fever, and 363 to diarrhea and dysentery. The death-rate in May and June was not greater than in the army in time of peace; in July it increased; in August it became excessive; but in September it was reduced once more to somewhat above the percentage normal in well-cared-for cities.

J. McG. Woodbury² describes a **new sink** which he has invented for **camp use**. It can be built at a cost of five dollars for each battalion.

H. I. Raymond³ gives a study of the **morbidity of Chickamauga Park** among the soldiers, attributing it largely to the use of improper drinking-water, the boiled water furnished the soldiers being unsightly and unpalatable. The introduction of water-filters was expected to cause marked decrease in the rate of sickness, which was exceedingly high. In one month 735 out of 9833 men had been admitted to division hospitals, and the actual number of the sick reported at times equalled the mean strength of the regiment for the month.

R. Speer⁴ draws attention to the remarkably **good health of the navy** when subjected to tropical conditions during the war. This was due to very careful quarantine and disinfecting measures and to using only distilled water for drinking-purposes. The navy quarantined against the army, even prize crews were disinfected when they returned

¹ Surg.-Gen.'s Reports, 1893.

³ Ibid., Aug. 4, 1898.

² Med. News, Aug. 6, 1898.

⁴ Ibid., Aug. 27, 1898.

to their ships, and there was the utmost care about allowing men to go ashore. The navy was therefore entirely free from yellow fever, malaria, and dysentery, and the only illness of any importance was a mild diarrheal affection. There were only 3 deaths on the ships about Santiago: 2 were suicides and 1 an accident.

C. E. Woodruff¹ discusses the **army-rations** supplied to the troops of different nations, and advances evidence that when considered in relation to the national dietary, our army-ration is one of the poorest. Also, he greatly deplores the fact that our ration cannot be increased at times of special strain, and that different forms of food cannot be substituted for those prescribed when this is considered necessary. Perhaps the greatest and most reasonable cause of complaint during the late war was that there was no means of obtaining a constant and certain supply of food.

J. T. R. Davison² describes the **hygienic improvements** that have been carried out in the city of Buenos Aires since 1874, and the results that have accrued therefrom. The city was previously always exceedingly damp, owing to the lack of proper drainage to carry off the surface-water. Since drains have been put in the soil has become much dryer and there has been a striking decrease in the mortality from tuberculosis and tetanus.

A. Chelmonski³ has investigated the **temperature of aged people** in 111 inmates of a home, and finds that the average temperature decreases late in life, and at times shows an inverted type in the very old, this being seen in 31% of 15 persons whose ages varied between 71 and 98 years. He considers this the result of imperfection of the mechanism regulating the body-heat; this was held to be the result of arterio-sclerosis.

J. M. Loeb⁴ has investigated the condition of the **pulse and the temperature** in 140 persons, whose ages varied from 60 to 90 years. He found that the pulse in the aged was somewhat more frequent than in those in middle life, though but little so. The body-temperature was on the average somewhat depressed, the average registration being about 36.6° C. Women showed somewhat higher body-temperature and somewhat more rapid pulse than the men.

L. J. Brooks⁵ discusses **subnormal temperature**, dividing it into four groups: 1. When normal to the individual. 2. As a prodrome of disease. 3. Occurring in the course of disease. 4. The result of infectious processes. He describes a case which occurred in a woman of 39, whose general appearance was good and who had no abnormal physical signs, excepting that her temperature was always low, about 96.8° F., and she seemed to have a small heart. She was excessively languid. The rest-cure caused improvement, but she relapsed repeatedly. Numerous suicides had occurred in her family. The causes of subnormal temperature are believed to be abnormalities in the nerve-supply or toxemia. He cites instances to prove that persons whose temperature is subnormal have small hearts.

A. Schücking⁶ has used **sodium saccharate** in solution for trans-

¹ Med. Rec., May 20, 1899.

³ Deutsch. Arch. f. klin. Med., Sept. 6, 1898.

⁵ Med. Rec., Nov. 12, 1898.

² Lancet, Aug. 6, 1898.

⁴ Wien. med. Woch., Apr. 15, 1899.

⁶ Deutsch. med. Woch., May 11, 1899.

fusion purposes, because of its marked affinity for CO_2 . The results reported are excellent. The solution employed was 0.08 % sodium chlorid and 0.033 % sodium saccharate.

T. F. Reilly¹ discusses the technic and uses of **saline infusions**, advising intravenous injections. He insists upon their value in anemia from hemorrhage because of the increase in blood-pressure coincident with hemostatic action, and for the same reason suggests their use in typhoid ulcer and in hemoptysis. He believes that the increase in temperature caused by the introduction of the solution results in the production of antitoxins, the increased heat stimulating their development.

TYPHOID FEVER.

Etiology.—P. Horton-Smith,² in an elaborate study of the part taken by the **urine and feces in the dissemination** of typhoid fever, reaches the conclusion that the urine should receive more attention than is commonly given and should be constantly sterilized, since it is probably more active in spreading the disease than are the feces. The latter are extremely infectious in the earlier stages of the disease and until about the third week; but commonly the bacilli rapidly disappear after this period, while bacilli are found in the urine in about one-half of the cases, usually in pure cultures, and they are likely to remain for weeks or often months, and are usually present in enormous numbers. He advises that urotropin be given in doses of 10 gr. 3 times a day in all cases in which the urine is shown by bacteriologic examination to contain bacilli. [However valuable any internal antiseptic may prove, the simpler plan of sterilization of the voided urine is the only one to be relied upon. The use of internal antiseptics is unnecessary and may be harmful.]

P. Boobyer,³ in discussing enteric fever in Nottingham, condemns the use of the **midden-privy**, and shows that in houses having midden-privies there was 1 case of typhoid in every series of 37 houses, while but 1 case occurred in every 558 houses in which water-closets were used. C. Porter⁴ presents a statistical study of the same subject, showing that the **privy** is of marked evil influence in the dissemination of typhoid fever. F. Wyatt-Smith⁵ records 3 cases of typhoid fever which appeared among the domestics in 1 family. All were traced to a leak in a waste-pipe which emptied into a cesspit, the latter receiving also the outflow from a water-closet which had been used shortly before by a servant who afterward developed typhoid fever.

M. A. Veeder⁶ discusses the **importance of flies** in the dissemination of typhoid fever, and especially in military camps during the Spanish-American war. This means of infection can be guarded against only by disinfecting the stools at once in all cases. J. F. Clarke⁷ also insists upon the importance of this mode of dissemination. It would seem scarcely necessary to demonstrate the possibility of such dissemi-

¹ Med. Rec., Nov. 12, 1898.

³ Quart. Med. Jour., Oct., 1898.

⁵ Brit. Med. Jour., Mar. 25, 1899.

² Lancet, May 20, 1899.

⁴ Lancet, Oct. 29, 1898.

⁶ Med. Rec., Jan. 7, 1899.

⁷ Phila. Med. Jour., Oct. 29, 1898.

nation, but Sengree¹ investigated the transmission of infection by flies, by placing them in Petri dishes in which there were cultures of various microorganisms, and then allowing them to wander over sterile agar. The growth of various microorganisms on the agar demonstrated the danger of transmission of disease by flies. Joly² has also demonstrated the danger of infection through flies by having these insects walk over gelatin plates and obtaining cultures from these plates. He notes a number of diseases which are undoubtedly spread through insects, sometimes through mere contact, sometimes through the insects carrying the organisms in their internal organs, examples of the latter being seen in plague and malaria. W. M. L. Coplin³ has investigated the same subject with a similar result. [We recall the account given by Agnew of a case of transmission of anthrax by flies.]

H. A. Haubold⁴ describes the conditions that existed at Chickamauga while the army was in camp there, and attributes the illness to the bad **hygienic conditions**. He states that the subsoil is very thin and that a stratum of rock lies very near the surface, so that the water-supply became readily infected, and the soldiers could not be prevented from drinking it. The typhoid-fever epidemic was extremely virulent; the temperature was often high and the delirium very violent, and it was difficult to carry out proper treatment, as ice could scarcely be obtained and the milk-supply was entirely insufficient. The nurses were few and ill-trained. [In camps the difficulty of preventing soldiers from drinking water not intended for that purpose is one of the most important elements to be considered in the spread of the disease. Strict discipline is invariably repaid by decreased illness.]

Pathology.—J. H. Bryant⁵ describes a case of typhoid fever **without lesion of the intestine** which occurred in a child of 1 year and 9 months. The Widal reaction had been positive during life and the symptoms were fairly typical. The postmortem showed enlargement of the spleen and mesenteric glands, and bronchopneumonia; the typhoid bacillus was present in the mesenteric glands. There had been severe diarrhea, a proof that this symptom is toxemic and not due to local disease of the bowel, since the intestine was found entirely normal. [It does not follow that the diarrhea of typhoid fever is wholly toxic. Many facts show that it is in part of this nature.] A. J. Lartigan⁶ describes 2 cases of typhoid septicemia, in 1 of which there were no intestinal lesions. In the first case cultures from the spleen, liver, mesenteric glands, bone-marrow, heart's blood, and kidney showed the typhoid bacillus. The patient had been ill about 10 days. The second case was ill about 3 weeks and showed no intestinal lesions; but typhoid bacilli were obtained by culture from the heart's blood, lungs, liver, gallbladder, and spleen.

A. Delafarde⁷ records a case of typhoid fever in a boy of 15, in whose blood typhoid bacilli were found twice upon culture. He was admitted on the twentieth day of the disease, and had a **profuse purpuric eruption**, due, it was believed, to the bacillemia.

¹ Med. Rec., No. 3, 1899.

² Gaz. des Hôpitaux, Nov., 1898.

³ Phila. Med. Jour., vol. iii., p. 1303.

⁴ Med. Rec., Oct. 22, 1898.

⁵ Brit. Med. Jour., April 1, 1899.

⁶ Johns Hopkins Hosp. Bull., Apr., 1899.

⁷ Gaz. hebdom. de Méd. et de Chir., May, 1899.

Schulz¹ describes an interesting postmortem finding in a case of typhoid fever. The intestinal lesions were characteristic; and further than this there were a number of swollen red areas on the under surface of the **epiglottis**, which microscopically were seen to consist of lymph-cells, and in the connective tissue beneath them there were large numbers of staphylococci and bacteria which presented the characteristics of the typhoid bacilli. [Lesions of the pharynx, esophagus, and upper air-passages are no doubt much more frequent than is usually believed.]

W. Fordyce² reports a case of **intrauterine typhoid fever**. The mother died of typhoid fever in the fifth month of pregnancy. Externally the fetus seemed entirely normal, and the organs appeared healthy to the naked eye. Cultures of typhoid bacilli were, however, obtained from the kidney, the spleen, and the intestinal contents, though the blood seemed sterile. Fordyce believes that typhoid fever may be communicated to the fetus with several possible results: the first being premature expulsion; the second, that the fetus may be born alive and suffer from typhoid fever; and the third, that it may be born alive and healthy.

Symptomatology.—E. Jauchen³ has observed an epidemic of typhoid fever in which the **incubation-period** could be accurately determined. The subjects affected were 36 soldiers who had, on one day during a homeward march, drunk freely of water in a village infected with typhoid. The incubation-period was as follows: In 3 cases, 2 days; in 7, 3 days; in 6, 4 days; in 4, 5 days; in 4, 6 days; and in 5, 7 days. Only 7 cases showed an incubation of longer than 1 week, and this short period is thought to be explained on the ground that the soldiers were exhausted at the time they drank the infected water. Apert⁴ reports an observation upon his own person to show that the incubation-period of typhoid fever may be very protracted. He was studying the serum-diagnosis of the disease, and thinks that he unquestionably infected himself in this work. For a month and a half he had headache, pains in the back, occasional epistaxis, and moderate emaciation. After this time the disease appeared in typical form. The serum-reaction was positive on the second day. The fever lasted for a short time only. [It is quite possible that the disease was in full course before it was recognized as such, and that therefore the incubation was not so long as described.]

J. Tyson,⁵ in discussing **observations made upon the soldiers** admitted to the University Hospital, states that 112 cases of typhoid fever were treated there with but 5 deaths, the mortality being 4.5%. Nearly two-thirds of these cases showed diarrhea, the remainder having been constipated through practically the whole of the attack. Rose-spots were observed in 53.5%, and seemed to have been absent in the others. Hemorrhage occurred in 9 cases, or 8%; and perforation terminated 1 case. Of the patients with hemorrhage, 2 died and 7 recovered. The Widal reaction was present in 77%, in 2.1% it was doubtful, and in 20.7% it failed. These results, however, are considered somewhat untrustworthy. In 7% of the cases thrombosis occurred. The notes record but 3 instances of the presence of albuminuria. The malarial organism was

¹ Berlin. klin. Woch., Aug. 22, 1898.

² Scottish M. and S. Jour., July, 1898.

³ Wien. klin. Woch., July 7, 1898.

⁴ Bull. méd., p. 1013, 1898.

⁵ Phila. Med. Jour., Feb. 25, 1899.

found during convalescence in 2 cases, and in 1 other case it was found when the patient was admitted to the hospital, but not subsequently. Orchitis was seen in 1 case. Relapses occurred in 12 cases, a percentage of 10.7. So far as determined, the average duration of the disease in the whole series of cases was $41\frac{4}{5}$ days.

J. C. Wilson,¹ in reporting observations at the German Hospital, records 147 cases, among which there was a mortality of 3.4%. He notes, however, that in connection with this low mortality one must remember that the average age of the patients was but 23.5 years, and that all were picked men who but a few months before had been known to be in excellent physical condition. Of these cases, 64.6% were from Camp Meade, and over 25% from Camp Thomas, Chickamauga. The temperature became normal on an average of 22.4 days from the beginning of the attack; the average duration of the stay in the hospital was 31.2 days. Hemorrhage occurred in 5.4% of the cases. In 1 fatal case 2600 cc. of blood were lost in 6 discharges from the bowel. Relapse occurred in 14.2%. Multiple relapses occurred in 3 instances. The Widal test was carried out at the hospital and at the city laboratory in all cases. In 5 instances the records from both places were negative, and 4 of these cases were unquestionably typhoid, while the fifth was doubtful. Venous thrombosis occurred in 5 cases, in every instance in the left leg only. The malarial parasite was found in 35 cases, usually nonpigmented intracorpuseular bodies; but also free hyaline bodies, and free pigment in the blood. In several cases, chills controlled by quinin, developed during convalescence.

A. V. Meigs² states that 214 cases of typhoid fever were treated at the Pennsylvania Hospital, with a mortality of 8.88%. A number of these patients, however, were convalescent upon admission. Meigs treated 48 cases himself; 2 of these were fatal. He condemns the Widal reaction as applied to health-board work, since he has often had positive reports when the patients had not typhoid fever; and, on the other hand, it had often been negative when the patients undoubtedly had typhoid fever. He mentions a case in which were all the symptoms of typhoid fever, even to rose-colored spots on the abdomen and repeated hemorrhage from the bowel, the Widal reaction being positive. The man had been sick 3 weeks before he entered the hospital, but soon grew better. Nine days later he grew worse again, and passed through a rapid course of acute tuberculosis. The mesenteric glands were not found enlarged; there was no alteration of Peyer's patches, though there were irregular ulcers in the lower part of the ileum and the colon, and a general eruption of miliary tubercles was found. This case is believed to be strong evidence against the value of the Widal reaction. [Testimony of this kind is positive only when complete bacteriologic investigations have shown the absence of the typhoid bacillus; and at the late period of this man's death it is possible that even bacteriologic examination might have been negative, and yet that the man had passed through typhoid fever.] The mortality under the bath-treatment is compared with the mortality of the patients who were sponged. For the former it was 11.58%; for the latter, 6.72%. Meigs believes that this speaks strongly against the use of the bath. He admits that the records of such

¹ Phila. Med. Jour., Feb. 25, 1899.

² *Ibid.*

a small number of cases cannot be considered of great importance in deciding such a question.

B. F. Stahl¹ observed, at St. Agnes's Hospital, 144 cases of typhoid fever. He notes the occurrence of a temperature of 107° F. in 1 case, of more than 106° F. repeatedly in 3 cases, and in many others the temperature was frequently very high. The blood in all cases was examined at the city laboratory, and in 10 instances the report was negative. He notes that diarrhea was decidedly infrequent in these cases, most of them being markedly constipated. The general mortality was 2.8%. Six cases of phlegmasia occurred, 4 of hemorrhage, 2 of orchitis, and in 4 cases scorbutic conditions of the gums. Gangrenous dermatitis was seen in 10 cases, the trunk being most commonly affected, after which the face, neck, gluteal regions, genitals, and legs were the most common seats of the gangrene. These cases did not come from the same camp, nor did the gangrene occur in one ward or floor of the hospital, nor in those cases under the care of one set of nurses. Therefore it did not seem to be due to any local cause of infection. The gangrene occurred chiefly in those who had marked circulatory disturbance, such as very weak heart, arterial change, or phlebitis. The rapidity of its development was most striking, and in favorable cases was succeeded by quite as rapid healing of the necrotic areas without any resulting scar. Three of the cases were fatal.

R. G. Curtin,² of 200 cases that had been treated at the Presbyterian Hospital, noted that most of them were mild, of short duration, and followed by few sequels.

J. M. Anders³ saw many serious cases among the 266 cases treated at the Medico-Chirurgical Hospital. There were 26 cases of hyperpyrexia; circulatory failure was frequently present; severe hemorrhage occurred repeatedly; in 2 cases insanity occurred, and in 2 hemiplegia; in the same number purpura was observed; 13 of the cases were fatal. Combined typhoid fever and malaria was never found, though carefully looked for.

H. M. Vinke⁴ studied the **epidemic** of typhoid fever which occurred at St. Charles, Mo., during which 200 cases developed in a town having 7000 inhabitants. The mortality reached 8.7%. In the fatal cases intestinal hemorrhage was observed 5 times, perforation 4 times, erysipelas once, and meningitis is stated to have occurred once, but there is no post-mortem reported. Orchitis is noted as a complication in one instance. True relapse occurred but once. Three cases were treated by the Woodbridge method, and there was certainly no abortive effect, one case lasting 41 days, one 28 days, and one 24 days. The cause of the epidemic was contamination of the water-supply by sewage which contained dejecta from a case of typhoid fever.

G. A. Muehleck⁵ reports the results of his **examination of the blood** of 90 soldiers, chiefly dealing with the morphologic elements. The red cells were reduced in practically all cases, the most marked reduction being found in the fourth week, when the number frequently fell below 3,500,000. The hemoglobin was likewise reduced, and the reduction persisted into the fifth week, when there was some increase. He notes hypoleukocytosis in 79.1% of the cases, but an increase of leuko-

¹ Phila. Med. Jour., Feb. 25, 1899.

² Ibid.

³ Ibid.

⁴ Med. News, July 30, 1898.

⁵ Phila. Med. Jour., May 20, 1899.

cytes in 20.9%. A very considerable number of these cases, however, had evident complications that would explain the increase. In 7 of the entire series of cases extracorpuseular and intracorpuseular bodies that sometimes contained pigment, and that in 2 instances showed ameboid motion, were observed. It is considered probable that the ameboid bodies at least were plasmodia; but in none of these cases were there any clinical indications of malaria. [Undoubtedly malarial manifestations are frequently absent during the course of typhoid fever, though malarial infection is present. These cases are prone to exhibit malarial symptoms during convalescence from the typhoid fever.]

Alezais and François¹ have made a study of the **arterial tension in typhoid fever**, with a view to determining its value in prognosis. They reached the conclusion that while ordinarily the tension is lowered in proportion to the severity of the disease, no dependence can be placed upon this sign, since in some cases of but moderate severity there is great lessening of the tension, and in some of the gravest cases, owing to pulmonary or other complications, the tension is fairly good and sometimes normal or excessive. The study of the tension, therefore, has some value, but it is of much less value than determining the rapidity of the pulse, the latter being one of the most important of all signs in establishing a prognosis. [The authors could with entire propriety have gone a step further and asserted that the most valuable of all indications are the rhythm and character of the sounds heard in auscultation of the heart.] Contrary to this assertion, however, Rosenthal² found in 7 of 57 cases of typhoid fever that the **first sound of the heart was everywhere inaudible**, and in 5 other cases it was practically inaudible at the base. This symptom seemed to bear no definite relation to the severity of the disease, and did not necessarily indicate any serious complication. The author thinks that it is due to some functional difficulty with the cardiac nerves, and not to inflammation of the myocardium, since its occurrence is very irregular, and when the sign is noted the condition of the circulation may be very variable. [This report is at variance with accepted belief and with our own experience. Weakening of the first heart-sound is regarded by nearly all clinicians as a sign of evil omen, and we believe that this view is well founded.]

C. E. Woodruff³ directs attention to the fact that cases of fever, particularly typhoid fever, run a more favorable course and have lower temperature in **dry climates**, as a result, he thinks, of the readier evaporation of the moisture and consequent greater dissipation of heat. He states that in the Philippines the continuous bath is frequently used with strikingly good results; the patient being immersed in water at about 90° F., and the temperature subsequently reduced by ice to 70° or 75° F.

G. Dock⁴ records the case of a soldier who had been in Porto Rico and who had an attack of typhoid fever which began with severe **chills** on each of 3 successive days. He had had no fever before this time. There were no malarial organisms in his blood. The temperature rose rapidly after the chills and went through the course usual in typhoid fever.

¹ Rev. de Méd., Feb. 10, 1899.

³ Phila. Med. Jour., May 27, 1899.

² Klin. Therap.-woch., Sept. 18, 1899.

⁴ Physician and Surgeon, Apr., 1899.

Complications.—G. P. Yule¹ reports 10 cases of **perforation** in typhoid fever. In his experience the onset is likely to be gradual in many cases. Only one of those reported showed violent onset. There was no immediate primary shock in any of the 10 cases. The distention that commonly follows may be postponed for hours. There may be but little change in the pulse and no severe pain, and the patient may take nourishment freely. Under such circumstances there may be an entire lack of the usual anxious expression, the position may not be typical, and in general it may be extremely difficult to determine that such a grave complication has arisen. Two patients were operated on; 1 recovered and 1 died. [We must agree that our experience has been that the onset of the complication is insidious in some cases; but we believe that this is much more infrequent than the author intimates. On the other hand, it is undoubtedly true that textbooks and teachers give an equally erroneous impression in describing the symptoms as sudden and vehement in most cases.]

D. J. M. Miller² reports a case of typhoid fever which occurred in a girl of 11, in which there occurred a sudden fall of temperature and increase of tympany, these symptoms having been preceded by tenderness and rigidity of the recti muscles. The seeming perforation was followed by convalescence. This was interrupted by a relapse, and again there were symptoms of perforation, this time with fatal issue. Autopsy showed **two perforations**, one of which had been closed by an adherent tag of omentum; the other was quite recent. [The case is of very great interest in showing the possibility of spontaneous cure of perforation. Of course, this must be very unusual.]

R. H. Fitz and H. H. A. Beach³ describe a case of typhoid fever which presented symptoms of peritonitis in the right iliac region during the third week. A perforation was believed to exist, and the abdominal cavity was opened. The ileum was found **perforated** near the ileocecal valve. The perforation was closed by Lembert sutures, the abdomen flushed with hot water and closed. The further history of the case is not given.

J. M. DaCosta⁴ reports 5 cases of **jaundice complicating typhoid fever**. From a study of these cases and from those which he has collected from the literature, he decides that when it appears this complication commonly does so after the middle period of the fever is past, though sometimes it may occur before the fever begins. It is usually an accompaniment of a severe case, chills often occur, and vomiting is frequent. The stools are not commonly clay-colored, but are more like dark typhoid stools; epistaxis is frequent. Of 52 cases which DaCosta has collected, 32 ended in death. In 28 of these there were evidences of degeneration of the hepatic parenchyma. The method of treatment seems to have no influence upon the production of the condition, nor does the age of the patient; it has occurred in every period of life excepting early childhood. The author discusses other diseases of the liver complicating typhoid fever, and reports 22 cases of abscess which he has discovered in the literature and upon which he has based the following points in diagnosis: There are usually severe and repeated

¹ Edinb. Med. Jour., Apr., 1899.

³ Ibid., Oct. 20, 1898.

² Boston M. and S. Jour., May 25, 1899.

⁴ Am. Jour. Med. Sci., July, 1898.

chills, marked variability of temperature, much sweating, and pain in the region of the liver. Jaundice is usually absent. Pylephlebitis gives a very similar picture, but is distinguished by the presence of enlargement of the subcutaneous veins of the abdomen and ascites. DaCosta thinks that there may be a **biliary typhoid** without intestinal lesions, resulting from the direct action of the bacilli or of their toxins upon the liver. Gallbladder complications are frequent in typhoid, cholecystitis being the gravest, having caused 39 deaths in the 58 cases of this condition which DaCosta has found reported. Pain, tumor, and jaundice are the important symptoms, the first being the most constant. Chills are nearly always absent, though nausea and vomiting are frequent. The condition is most likely to be confounded with appendicitis.

R. T. Morris¹ describes a case which he believes was one of **primary typhoid infection of the gallbladder**. It occurred in a man of 26, and began with severe pain in the region of the gallbladder, soon followed by symptoms of general peritonitis. A tumor was found at the side of the gallbladder, and operation showed that this was an empyema of this viscus, the contents being thick pus. The temperature decreased somewhat then, but the patient shortly afterward showed the typical symptoms of typhoid fever, which ran the usual course, ending in recovery. No bacteriologic examination of the contents of the gallbladder is reported.

J. Anderson² reports a case of typhoid fever which terminated by **perforation of an ulcer of the gallbladder**. There had been some pain and tenderness in this region before death, but no marked symptoms. The postmortem disclosed numerous small ulcers of the gallbladder; localized peritonitis with abscess-formation was found about it.

C. N. B. Camac³ describes a case of typhoid fever in which **cholecystitis** came on during the fourth week of the disease. The gallbladder was tapped, and bacilli having the morphologic characteristics of typhoid bacilli were found in the fluid. Another tapping was undertaken, but as it was unsuccessful cholecystotomy was done, and 120 cc. of fluid were removed from the gallbladder. Death, however, followed. The literature on this subject is reviewed, and of 28 cases Camac finds that 21 resulted in perforation, so that energetic treatment is necessary; cholecystotomy or aspiration should be done, preferably cholecystotomy.

A. Fränkel⁴ discusses the **affections of the respiratory apparatus** associated with typhoid fever. He first directs attention to the confusion that has accompanied the use of the term pneumotyphoid, some of the cases being real pneumonia, merely presenting a typhoid course; others, a combination of pneumococcus-pneumonia with typhoid fever; and, third, there are the real cases, which are typhoid fever with marked pulmonary symptoms, the lung-symptoms probably being due to the direct action of the typhoid bacillus in association with other microorganisms. He reports an interesting case as an example of the difficulty in being positive after clinical examination that the case is one of pneumotyphoid. This occurred in a girl of 21, who died after having presented a typical typhoid appearance with enlargement of the spleen and eruption of rose-spots upon the abdomen, together with consolidation of the lungs.

¹ N. Y. Med. Jour., Jan. 28, 1899.

³ Am. Jour. Med. Sci., Mar., 1889.

² Lancet, Apr. 22, 1899.

⁴ Deutsch. med. Woch., Apr. 13, 1899.

After death, however, the intestines were found free from any lesions, while there was a typical fibrinous pneumonia of the right upper lobe and, to some extent, of the left upper and lower lobes. The spleen was enlarged. [Bacteriologic examination does not seem to have been made; it is therefore possible that the case was pneumotyphoid.] In the atypical forms of pneumonia Fränkel finds from his investigations that the pneumococcus is usually the only microorganism present. He has investigated a large number of cases and has never found any other microorganism active in the disease, and he believes that the reason streptococci have been frequently found is that the pneumococcus is often discovered in streptococcus-form in the sputum, and that the secretions from the mouth and pharynx are constantly infected with the streptococcus. If the streptococcus-form of pneumococcus be injected into mice, subsequent cultures will give typical lancet-shaped cocci.

C. Achard¹ reports 2 cases of **pleurisy** following typhoid fever. One of them became purulent. In both repeated paracentesis was undertaken, and in the suppurating case operation was finally carried out. Both recovered. It was found that the fluid removed from the pleura gave a typical reaction with the typhoid bacillus in both cases.

J. C. Wilson² discusses a **renal form** of enteric fever, reporting the case of a boy of 19, whose symptoms were for some time purely those of acute nephritis; but the Widal test was positive and there were slight hemorrhages from the bowels. The temperature after a few days declined somewhat, but subsequently rose again, and the patient became delirious, and albumin, casts, and blood-cells reappeared in the urine. Subsequently, however, the usual symptoms of typhoid fever developed, and the common course of that disease was passed through and the patient recovered. Wilson insists upon the importance of these cases because of the danger of administering improper diet to them, the likelihood of using purgatives improperly, and, most important of all, the danger of infection of others through overlooking the disease. Very similar cases are described by Rostski,³ who found that renal involvement had been noted in 59.2% of 346 cases treated during the past 12 years in the Würzburg clinic. Albuminuria is more common in the early stage of the disease. In 37 of the cases there were evidences of severe nephritis; 7 of these were fatal, while of the remaining 309 but 20 were fatal. He then discusses those cases in which typhoid fever begins with renal symptoms, and describes 2 such cases. In the first case the illness came on with the usual signs of acute violent nephritis, the typical typhoid symptoms appearing later. In the second case the patient, who was convalescent, received enemas for constipation, when peritonitis came on and the hemorrhagic nephritis returned; she recovered, however.

T. Houston⁴ reports the discovery of the typhoid bacillus in the urine from a case of **cystitis** which had lasted for 3 years. The study was begun in the belief that the colon-bacillus would probably be found; but a bacillus identical with that of typhoid fever was discovered; it reacted with the patient's blood, and the blood also reacted with other cultures of the typhoid bacillus, and not with the colon-bacillus. It seemed to be a case of typhoid infection without the usual symptoms or lesions

¹ Sem. méd., Oct. 19, 1898.

³ Münch. med. Woch., Feb. 14, 1899.

² Am. Jour. Med. Sci., Dec., 1898.

⁴ Brit. Med. Jour., Jan. 14, 1899.

of typhoid. The history showed that there had been at no time any severe symptoms, and at no time in the course of the cystitis was there any evidence of a new or more severe infection; therefore Houston believes that the original infection was with the bacillus of Eberth. The fact that this unusual local result ensued from the infection and that the general system escaped might be due to a lack of general susceptibility to the typhoid bacillus; to the fact that the bacillus discovered was of different virulence from the one which commonly causes typhoid; or possibly typhoid fever may be the result of other factors than the bacillus of Eberth alone. [A number of cases might be collected from the literature in which the typhoid bacillus has been found in actively vegetative form in lesions of many months' or even of several years' duration. This is especially noted in the case of bone-lesions.]

G. Blumer¹ reports a case which occurred in a woman of 45, in which in the fourth week after the onset of typical typhoid fever swelling and pain appeared at the junction of the fourth rib with the sternum. The introduction of a needle revealed no pus. Five months later, however, she was seen because of a nodule in the left breast, and this was removed; but a sinus remained, and a later operation showed **necrosis of the fourth rib** at its junction with the cartilage. Bacteriologic examination showed the presence of the colon-bacillus. Removal of the necrotic portion of the rib and packing of the wound caused it to heal perfectly by granulation.

Takali and Werner² record a case of posttyphoidal **suppuration** which was unusual because of its situation in the **glands of Bartholin**. The pus contained a pure culture of typhoid bacilli.

A. Loeb³ discusses the question of **meningotyphoid**. He reports the case of a boy of 18, who was admitted probably at the end of the first week of his illness. He was very stupid, but presented somewhat the appearance of typhoid, with fever, and enlargement of the spleen and liver. He showed marked right-sided papillitis, however, and the veins were distended; the temperature ran a very irregular course, with only slight elevation. The patient developed rigidity of the neck and the papillitis continued, the edges of the papilla being blurred, but the physiologic cup was present. The Widal reaction was negative. Gradually, however, the symptoms became more like those of typhoid; the stiffness of the neck and blurring of the papilla disappeared, and toward the end of his illness the Widal reaction was positive. It seemed, therefore, undoubtedly typhoid; but Loeb, after reviewing the literature, decides that it was probably an infection which first attacked the meninges and produced a serous meningitis. Lumbar puncture in this case had been negative; but Jemma has reported an instance in which lumbar puncture in typhoid with meningeal symptoms yielded fluid which contained typhoid bacilli; and although in many cases thought to be meningitis with typhoid the postmortem examination has shown normal microscopic appearances of the meninges, Loeb believes with others that this cannot be taken as final evidence of the absence of serous meningitis. He considers the papillitis a positive sign of increased intracranial pressure, and since any sign of tumor or abscess was absent in

¹ Pacific Rec. of M. and S., Nov. 15, 1898.

² Zeit. f. Hyg., p. 31, 1898.

³ Deutsch. Arch. f. klin. Med., Band lxii., Hefte 3 u. 4.

this case, he believes that it positively indicated meningitis. The reflexes were much increased in this case, and they have been noted to be increased in many other cases of typhoid. It is uncertain whether this should be considered a sign of involvement of the nervous system or not.

W. W. Kerr and H. Moffitt¹ reported a case of typhoid fever which ran a course suggesting **tuberculous meningitis**, though there were no eye-symptoms and no hyperesthesia. The Widal reaction was positive toward the end of the disease, which was fatal. The autopsy showed enlargement of the spleen with ulceration in the ileum, and there was a purulent meningitis from which cultures of the typhoid bacillus were obtained. The meningitis was due to general infection, and not to any local disease, such as mastoiditis.

Hugot² describes a case of **meningitis** complicating typhoid fever. At the autopsy the usual intestinal lesions of typhoid were found as well as a purulent meningitis, in the exudate of which the typhoid bacillus was present.

N. Ritscher³ discusses the literature concerning **paralysis** with typhoid fever, and reports 3 cases, in the first of which there occurred a right-sided hemiplegia which appeared on the thirty-fifth day of the disease, while the other cases both involved the left facial nerve and both appeared on the ninth day. In most cases posttyphoidal paralysis appears in the earlier period of convalescence. It usually disappears ultimately; though at times it remains and may cause death. Among the causes of the paralysis he mentions inflammation of the muscles and nerves, myelitis, and encephalitis, as well as embolism and thrombosis. Embolism and thrombosis may be due to the general circulatory failure, while in other instances paralysis usually results from the action of the typhoid toxins.

F. W. Sutler⁴ reports the case of a man of 24, who had continued fever (probably typhoid), and who suddenly during convalescence became completely paralyzed on the right side. The report is very imperfect.

Lopriori⁵ reports the case of a girl of 5, who had typhoid fever, and who on the seventeenth day of the disease developed a sudden **aphasia** without signs of paralysis. The difficulty in speech persisted for a month and a half. It was thought to be due probably to embolism.

M. Dide⁶ has made a study of 120 cases of **epilepsy** in order to learn whether typhoid fever is of importance in causing this disease. Among these 120 cases were 7 patients who had had typhoid fever. In 1 of these there was hereditary predisposition to epilepsy. In 2 others infantile convulsions had occurred, and this made it probable that typhoid fever was but an accidental cause of the outbreak of epilepsy. In 4 cases, however, there was no evident predisposition, the typhoid fever had run a severe course and had been accompanied by violent delirium, which in several cases was protracted, and the epilepsy had appeared soon after and had continued. From these cases, Dide is led to believe that typhoid fever may be an exciting cause of epilepsy. In none of the

¹ Jour. Am. Med. Assoc., Mar. 18, 1899.

² Gaz. hebdom. de Méd. et de Chir., No. 20, 1899.

³ Bolnitschnaya Gazeta Botkina, Nos. 45 and 46, 1899.

⁴ Georgia Jour. M. and S., Nov., 1898.

⁵ Gaz. degli Ospedali, Jan. 5, 1899.

⁶ Rev de Méd., Feb. 10, 1899.

cases was there any history of family tendency to nervous affections nor any personal history of past convulsions or other affections that might be responsible for an epileptic attack. Dide believes that the toxemia of the disease probably causes the epilepsy. [Undoubtedly severe illness of various sorts may be the exciting cause of epilepsy; may initiate attacks in individuals who are predisposed, or may convert a petit mal or nocturnal epilepsy into a severer type.]

E. W. Pressly,¹ among infrequent sequels of typhoid fever, records a case in which there was **purpura** associated with swelling of the joints, and in which recovery occurred; another case of purpura of very great severity in which there was hemorrhage into the skin and from many mucous membranes, and resulted in death 14 days after the appearance of the purpuric symptoms; a case of dry gangrene of the leg, the cause of which is not stated; a case in which sudden crossed paralysis occurred during convalescence, this being followed by symptoms of chronic hydrocephalus which were greatly improved by lumbar puncture; and additional cases in which the interesting observation was made that goiters present in each case disappeared rapidly after the occurrence of the typhoid fever.

J. M. DaCosta² observed 30 cases of **phlegmasia dolens** in the 215 cases of typhoid fever seen among the soldiers treated at the Pennsylvania Hospital, and in 135 additional cases this complication appeared after the fever had run its course; in the total number of cases there were $13\frac{1}{3}\%$ that showed the complication. The explanation of this frequency could not be found. It was thought possible that excessive marching had led to it; but it was found that most of the patients had been in camp. He believes the condition is primarily a thrombosis, and not a phlebitis, since there is no pain in very many of the cases in the early part of the attack, and no other evidence of inflammation. He has seen but one death from this cause in his experience; this was due to pulmonary embolism.

Heger³ describes a case in which there were the usual symptoms of typhoid fever and the positive Widal reaction; but tubercle-bacilli appeared in the sputum and the patient died with signs of acute **miliary tuberculosis**. The latter was found at autopsy, the lungs presenting tubercular pneumonia, and the liver, kidneys, and ileum showing numerous miliary tubercles. But while there were no typhoid ulcers in the intestine, cultures from the spleen showed typhoid bacilli. [This case is of interest in connection with the one quoted from Meigs's communication, *vide supra*.]

A. A. Eshner⁴ reports a case of typhoid fever in a tuberculous subject who also presented evidences of syphilis; and mentions another case in which death occurred soon after an attack of typhoid fever which had been followed by lobar pneumonia, and in which at the postmortem there were also lesions of chronic tuberculosis. Both cases seemed to be instances of **triple infection**.

H. Fischer⁵ reports an observation which he made some time ago of coincident **typhoid fever and trichinosis**. This occurred in a young butcher who had eaten infected meat. The most prominent symptoms were those of typhoid fever; the autopsy showed the lesions of

¹ Phila. Med. Jour., June 24, 1899.

² Boston M. and S. Jour., Mar. 23, 1899.

³ Soc. belge, d'Anat. path., Jan. 11, 1899.

⁴ Phila. Med. Jour., Mar. 25, 1899.

⁵ Deutsch. med. Woch., No. 52, 1898.

typhoid in the intestines. Operation upon a bedsore had shown during life trichinæ in the tissue removed, and they were also found in many of the muscles after death.

N. Senn,¹ in writing of the invasion of Porto Rico and of typhoid fever in that campaign, says that at the time of writing there were 250 cases at Ponce and 145 at Guayama, in almost every instance the disease having been contracted before the patient left the United States. It was usually mild in character. In one case there was a metastatic **abscess of the submaxillary gland**, which is a rare complication; and in another case death was caused by progressive **gangrene of the penis**.

Breton² reports a case of typhoid **orchitis** which resulted in suppuration and required removal of the testicle. A bacillus resembling the typhoid bacillus was found in the pus, but this was not absolutely differentiated. [This complication is rarely reported; but we have seen 3 cases within the past year, all of them in soldiers; in 1 there was suppuration, necessitating removal of the testicle.]

COMBINED TYPHOID AND MALARIAL INFECTION.

I. P. Lyon³ reports a case of **combined typhoid and malarial infection** which occurred in a man of 48, who had had repeated attacks of malaria some months before. These had been only imperfectly treated, and the patient had not recovered health between the attacks, so that malaria probably remained present. He was admitted on Jan. 5, 1898, with a history of daily chills since Dec. 18, 1897. At the time of admission he had the appearance of typhoid fever, but febrile paroxysms occurred twice in the 48 hours after admission. The course of the fever was characteristic, the Widal reaction was positive, and the leukocytes were reduced. He entered upon convalescence, but 9 days later developed febrile paroxysms and showed tertian parasites in his blood. Quinin was given at once upon their discovery, and after 3 paroxysms the disease was controlled and the patient left the hospital cured. A study of the 29 other certain cases of combined infection reported is given; and Lyon decides that the American conception of "typhomalaria" is erroneous, and that the French have given the correct description of this disease. The course in the cases studied was of average severity and often grave. Only one or two cases recorded were mild; the mortality was 33.3%. Complications frequently occurred. The typhoid picture usually dominated the scene. The malarial manifestations appeared at different periods, often being present at the onset of the disease, sometimes occurring during its course, but frequently being seen only in convalescence. In some cases they were present at the onset, disappeared entirely during the course, and reappeared during convalescence, the typhoid fever seeming temporarily to overcome the malaria. Quinin was usually given; and it is probable that had it not been for the treatment, the malarial symptoms would have continued to complicate the picture of the typhoid. Abdominal symptoms were marked in most of the cases, contrary to the usual American teaching; but bilious symptoms were not especially prominent. The most marked difference between the French descriptions and those

¹ Jour. Am. Med. Assoc., Sept. 10, 1898.

² Jour. des Prat., Sept. 3, 1898.

³ Am. Jour. Med. Sci., Jan., 1899.

given by Americans is that the latter state that the disease is mild, while French writers consider it severe. The latter is undoubtedly the proper conception. Lyon believes that combination of the diseases is not uncommon in our Southern States; but he does not think that the cases that have often been described as such have in most instances been true examples of this combination.

J. M. DaCosta¹ reports 10 cases of typhoid fever verified by the Widal test in which malarial plasmodia were found at some stage of the disease, usually during convalescence. The author especially notes the fact that the occurrence of the chills and other manifestations of malaria appear late, and sometimes only during a relapse. The **tertian parasite** was usually found; in some the **estivoautumnal** was present.

C. F. Craig² reports the case of a physician who had a combined typhoid and **quartan** malarial infection. The distinctive symptoms of typhoid, including the Widal test, were all present. About 3 weeks after the onset of the disease, however, when defervescence seemed to be progressing satisfactorily, he had repeated chills, and examination of the blood showed quartan parasites. The chills reappeared after intervals of 72 hours. After grave illness the patient recovered, the malaria being controlled by quinin.

A. Stengel³ states that he has seen 2 cases of typhoid fever in which the **tertian** variety of the plasmodium was found during convalescence.

M. Goltman⁴ observed a case in a boy of 14, which began with chill and polyuria. On the following day another chill occurred and intra-corporcular malarial organisms were found in the blood. Quinin was given up to the production of cinchonism, but the fever persisted and rose-spots appeared. Soon after, however, the temperature became subnormal and remained at that point for 3 weeks, when entire recovery occurred. It seemed, therefore, to be an **irregular** form of typhoid fever preceded by malarial infection.

T. F. Raven⁵ describes as **malarial enteric fever** a case that progressed through a course of what was thought to be typhoid fever, and toward the beginning of convalescence had a severe chill of typical malarial character, with a temperature of 105° F. There was a recurrence on the next day, and after the administration of quinin the attack ceased for a week, when there was another recurrence; but after the second administration of quinin the affection disappeared entirely.

Diagnosis.—R. Kraus and W. Seng,⁶ in studying the mechanism of **agglutination**, have investigated the theory that the bacteria are carried down mechanically by the precipitate. They made suspensions of India-ink, cinnabar, and other substances in bouillon, and found that when alcohol, sodium hydrate, and other substances causing precipitation were added, the substance suspended was agglutinated and carried down in the same way as bacteria are by the addition of a specific serum. They believe, therefore, that agglutination is due to the mechanical action of precipitation, the specific agglutinating substance forming the precipitate in the case of a specific reaction and carrying the bacteria down with the precipitate.

¹ Phila. Med. Jour., May 6, 1899.

² Ibid., Feb. 25, 1899.

³ Brit. Med. Jour., July 2, 1898.

⁴ Ibid., June 17, 1899.

⁵ Med. Rec., Sept. 17, 1898.

⁶ Wien. klin. Woch., Jan. 5, 1899.

G. H. Weaver¹ has studied the effect of the use of **cultures of varying degrees of virulence** in carrying out the Widal reaction. Of 4 cultures of different degrees of virulence he found in every instance that the best reaction was obtained with the least virulent culture. In 30 cases no positive reactions were obtained. Thirty-two cases of typhoid fever were examined: in 30 the fresh serum was used, and this method gave 27 positive results and 3 doubtful; the latter patients all died, and 2 of them showed the lesions of typhoid fever only, while 1 was also tuberculous. In all of these cases but one examination was made. In 2 of them the dried-blood method had given negative results. The dried-blood method was used in 29 cases, with only 19 positive results, 8 doubtful, and 2 negative. In 1 of these cases, in which a positive result was obtained, postmortem showed both tuberculous and typhoid lesions. Weaver considers the dried-blood test much less accurate than that with fresh serum.

McWeeney² **describes a method** which he uses in carrying out the **Widal test** in cases which do not present a satisfactorily distinct reaction. He allows the typhoid bacillus to grow in a hanging drop of broth which contains about 1% of the suspected serum. The preparation is kept at 37° C., and examined after 4 hours, when, if the case be typhoid, it is said the bacilli will be found to have grown into chains that later become twisted, while motility is entirely absent. If the serum is not typhoidal, the bacilli are separate and normal in motility. W. Leube³ states that a dilution of 1:10 or 1:15 in carrying out the Widal reaction for typhoid fever is insufficient. A positive result is of value only when the dilution has been as great as 1:30 or 1:50. Under such circumstances a positive reaction makes the diagnosis of typhoid very probable.

Kessel and Mann⁴ report the conclusions at which they arrived from a study of the Widal reaction in typhoid fever. They think that it is a **reaction of immunity**; but that it is not quantitatively in direct relation to the degree of immunity, and that the agglutinins are not the true immunizing substances. It is not absolutely pathognomonic of typhoid fever. They had positive reactions in 2 cases of erupous pneumonia during the course of the disease; but the reaction disappeared after recovery. They also report 2 cases of typhoid in which the reaction did not occur. The reaction was usually in direct proportion to the amount of relative slowing of the pulse, but showed no relation to any other symptoms, excepting that there was an inverse relation between the duration of the fever and the strength of reaction. There seemed, therefore, to be some correspondence between the strength of the reaction and a satisfactory prognosis. Twenty cases were examined after they had had typhoid fever. In those who had had the disease within 1 year, 64.5% of reactions were positive; in 11 cases which had had the typhoid fever between 2 and 5 years previously, 72.7% were positive. Positive reaction occurred in 4 cases that had typhoid fever 5, 10, 15, and 21 years before, respectively. They think, however, that if an individual is ill and shows a strong Widal reaction, this is valuable in diagnosis, and is to be

¹ Med. News, Dec. 10, 1898.

² Dublin Jour. Med. Sci., Sept., 1898.

³ Sitzungsbericht phys. med. Gesellsch. z. Würzburg, 1898.

⁴ Münch. med. Woch., May 2, 1899.

attributed to the present illness, and not to the former attack. They believe that it is the most valuable sign that we have of typhoid fever in children. Three nurslings whose mothers recently had typhoid fever gave no reaction, while the mothers did. The mother's milk gave a reaction in one case in a dilution of 1 : 1; in the second case in a dilution of 1 : 12; in the third case in a dilution of 1 : 50. In the latter case the reaction occurred with greater dilution of the milk than of the blood. The agglutinins did not seem to be transferred to the infants through the milk, since the blood of the child did not react in a dilution even as slight as 1 : 1.

Schabad,¹ as a result of his large experience with the Widal reaction, decides that when carefully carried out by an expert, it is a valuable diagnostic sign. He considers that marked or moderate reaction when using a dilution of 1 : 50 indicates typhoid fever. A negative microscopic reaction he believes excludes the disease. He thinks that the duration of the reaction is directly related to the severity of the disease; the intensity of the reaction less so. He notes that the **serum from bullæ** may be used instead of blood-serum. Examination of the urine for the reaction does not give reliable results.

Tarchetti,² in studying the **prognostic value** of the serum-reaction in typhoid fever, was unable to confirm Courmont's statement that the intensity of the reaction and the mildness of the disease were in direct relation to each other. This was not the fact in a number of instances in his work; and he notes as one especial complication of such a method of prognosis the occurrence of a relapse which makes the reaction more pronounced, even though the disease at the same time becomes more severe.

J. M. Anders and J. McFarland³ give the results of the Widal test as carried out in the cases of 230 soldiers, using the dried-blood method. All were believed to have typhoid fever, and 219 gave positive reactions; 10 gave no reactions when repeatedly tested up to the time of return of normal temperature, though there were 3 of these cases in which the diagnosis was somewhat doubtful. Of the 219 giving positive reactions, 128 gave reaction before the appearance of rose-spots. Eight of them gave no reaction as late as the twenty-eighth day, and 2 gave none even up to the twenty-eighth day.

A. C. Abbott⁴ reported that in the past 20 months there had been collected in the city laboratories (Board of Health) of Philadelphia the records of Widal reactions carried out in **4154 cases**, and that the error had been but 2.8 %.

R. C. Cabot and F. L. Lowell⁵ have made studies of **serum-diagnosis in dispensary-work**. They insist that the test can readily be done in outpatient work. In 204 cases of typhoid fever the results were negative in all. Positive reactions were obtained in 39 cases that had passed through typhoid fever within 1 to 18 months before the examination. Quantitative tests were made in a number of instances; in 1 case it was found that a positive reaction was obtained with a dilution of 1 : 1000.

¹ Medicinskoje Obosrenje, 1898.

² Gaz. degli Ospedali, No. 133, 1898.

³ Phila. Med. Jour., Apr. 8 and 15, 1898.

⁴ Ibid., Feb. 25, 1899.

⁵ Boston M. and S. Jour., Feb. 9, 1899.

Mossé and Fränkel¹ report the discovery of **agglutination-reaction** in the blood-serum of a fetus. The mother had had typhoid fever during her pregnancy.

Piorkowski² as a means of diagnosis grows typhoid bacilli on a **culture-medium** composed of 2 days' old **urine**, to which 0.5 % of peptone and 3.3 % of gelatin have been added and the mixture filtered. The colonies of typhoid bacilli are thread-like, radiating from the center; while colon-bacillus colonies are round, yellowish, and have sharply marked edges. Both develop in about 24 hours. It is important that the plates made from this culture-medium should be kept at a temperature of 22° C., in order to allow of typical growth of the colonies. [The author's experience with this medium has been too slight to put much faith in the result.]

K. Bohland³ has injected rabbits with **typhoid toxin** and with the serum of patients sick with typhoid fever. In both cases he found in from 10 to 15 minutes a **decrease in the leukocytes** which varied from 5 % to 66 %. In 1 case of typhoid he first observed a negative chemotactic action and the patient had hypoleukocytosis; later, coincidentally with the development of several abscesses, the patient developed hypoleukocytosis of 28,000, and his serum had positive chemotactic action upon the blood of rabbits. The toxin of the *Bacillus coli communis*, on the contrary, had a marked positive chemotactic action. Bohland therefore believes that hypoleukocytosis is a valuable differential sign of typhoid fever, and that it is due to a negative chemotactic action of the typhoid toxin. [The clinical value of hypoleukocytosis has been long recognized; but the author's explanation of the fact needs further confirmation.]

Treatment.—E. Walger⁴ has administered to 4 cases of typhoid fever **serum** obtained from **convalescents** from the same disease. The first case, which occurred in a woman of 41, who had become extremely weak and emaciated, showed decided improvement; particularly the violent headache improved almost at once after an injection of 10 cc.; and although the spleen continued to enlarge and a profuse eruption appeared the temperature remained low. By the fifteenth day the patient was practically well, and she was allowed to leave her bed on the twenty-first day of the disease. The second case, that of a weakly woman, 58 years old, was given an injection of the same amount on the eighth day. The temperature fell at once, and the next day was sub-normal; she seemed to be well on the thirteenth day and was allowed to be up on the fifteenth day. The third patient, a girl of 21, had a mild attack, but became much worse in the third week. On the twenty-fifth day 10 cc. of serum were injected without any definite immediate effects. The temperature fell in the following week after having been for some time excessively high, and about 2 weeks later, after having been entirely without fever for 5 days, a typical relapse occurred. The fourth patient, 34 years of age, received an injection on the seventh day. A slight rise of temperature occurred; but this was followed by a steady decline, and the normal point was reached on the thirteenth day; but a typical relapse occurred, and a second injection of serum was given. The temperature

¹ Soc. méd. des Hôp., Jan. 2, 1899.

³ Centrabl. f. innere Med., Apr. 29, 1899.

² Berlin. klin. Woch., Feb. 13, 1899.

⁴ Ibid., Sept. 17, 1898.

remained high for 2 days, and then fell by lysis and entire recovery ensued. In all of these cases the general condition became very much better after the injection of the serum; and in all but 1, at any rate, the fever disappeared remarkably early. There is no record of the Widal reaction in these cases, but the diazo-reaction was noted in all.

W. Spirig¹ describes a case of typhoid fever which was treated by an **antityphoid serum** prepared by Häfiger. The serum was used in doses of 10 cc. every day, 6 such injections being given. No unfavorable effects were noticed, and he thought that the general condition and local symptoms were distinctly improved.

V. Jez² has prepared a so-called **antityphoid extract** by repeatedly injecting into the peritoneal cavity of rabbits cultures of typhoid bacilli of increasing virulence. When the animals did not react to poisonous doses they were killed, and extracts made of the thymus, spleen, bone-marrow, brain, and spinal cord, by soaking these organs in a solution of salt, alcohol, and glycerin, to which some pepsin was added. The filtrate was injected into typhoid cases with, the author says, the most strikingly satisfactory results that he has ever seen from any treatment for typhoid, and he has found it quite as effective when taken by the mouth as when given subcutaneously. The temperature is said to have become remittent at once, and soon became normal. The pulse decreased in rapidity, the diarrhea decreased, and the general condition became much improved.

Giglioli and Calvo³ report their results from the use of physiologic **salt solution** in the treatment of typhoid fever. The amount given was 500 cc. Eighteen cases were treated. Usually the temperature rose temporarily after the injection, and subsequently fell to near normal, accompanied by slight general depression, some sweating, and a noteworthy increase of urine. Others have seen nausea and vomiting, chilliness, and mental excitement; but these the authors did not observe; and they believe that such symptoms were avoided by using only 500 cc. and introducing the fluid very slowly. The general condition improved subsequently, chiefly in proportion to the fall in the temperature and the improvement in the pulse. The authors consider it a valuable treatment in many cases, but do not think that it was ever the chief factor in the cure of the disease. They believe, however, that it is of use in prognosis, as in their experience the intensity of reaction to the injection was in direct proportion to the intensity of the infection.

W. M. Holladay⁴ reports his use of normal salt solution in a severe case of typhoid fever with marked nervous symptoms. The nervous condition improved greatly within 24 hours, and repetition of the injections was followed by distinct general improvement. When used at about 80°F. they caused a decided reduction of temperature.

S. Phillips⁵ considers combating the toxemia a most important element in the treatment of typhoid fever, and finds the use of antiseptics valuable, recommending especially mercuric chlorid and salol; also disinfectant enemas. There are certain cases which he considers lose strength

¹ Correspondenz-Bl. f. schw. Ärzte, July 1, 1898.

² Wien. med. Woch., Feb. 18, 1899.

³ Contributo Clinico allo Studio delle Iniezione sottocutanee di Siero Artificiale nella Febra Tifoidea, Florence, 1899.

⁴ Phila. Med. Jour., Nov. 19, 1898.

⁵ Brit. Med. Jour., Nov. 12, 1898.

owing to bloodlessness, the proofs of such a condition being found in the facts that the arteries of such patients, if opened after death, are found strikingly empty of blood, and that during life there is a remarkable decrease in the number of red blood-corpuscles and leukocytes, together with increasing weakness and rapid pulse, while the mental condition remains clear. The toxemia and the parenchymatous degeneration are the essential elements in the production of this blood-deterioration; to check it, sweats should be controlled by belladonna, and diarrhea kept in bounds, and the blood-volume increased by watery enemias; cold water should be taken freely. Oxygen inhalations are sometimes useful. Saline injections should be used if the condition becomes grave, and solid food, in Phillips's opinion, should be given 3 days after the temperature has been entirely normal throughout the whole 24 hours. [The blood-conditions here referred to have not been generally recognized, though a number of hematologists have described intense anemia during convalescence.]

J. Stewart,¹ in discussing the treatment of typhoid fever, recommends the **Brand method** as the best. His results in 408 cases at the Royal Victoria Hospital have been 95.6% of recoveries. Half of the fatalities were due to perforation or hemorrhage; and he believes that these complications are somewhat more frequent with the Brand method, but does not consider that there is any evidence that relapse is more frequent with this than with older methods of treatment.

J. C. Wilson² reports his results during the past 2 years with the hospital treatment of typhoid fever. He is unqualifiedly in favor of the regular use of the Brand method. The mortality in 217 cases was 7.8%; hemorrhage occurred in 17 cases, relapse in 41, nephritis in 56. Albumin was present in 89 cases. Of the deaths, 8 were due to intense infection, 5 to hemorrhage, 2 to perforation, 1 to peritonitis without perforation, and 1 to cardiac asthenia. A somewhat startling statement made is that in mild cases patients are allowed to walk from their beds to the tub, and return in the same manner after the bath, assisted by the attendant. [The frequency of nephritis is as difficult to estimate as the definition of the term nephritis is uncertain. We see no reason for "flying in the face of fate," in allowing patients to walk to the tub. It is useless for the author to plead that no evil results have occurred. The practice is indefensible.]

Liebermeister³ discusses the question of the **advisability of the reduction of temperature** in fever. Fever is recognized as usually a conservative process; yet Liebermeister shows that it is often necessary to reduce it because of the rapid metabolic destruction which it causes, and which becomes grave in protracted cases. As to the use of baths, Liebermeister believes that they should be used chiefly at night, and that the later the hour the lower is the temperature, which indicates the necessity for a bath. His experience with cold baths in typhoid fever in the Tübingen Hospital is that it has reduced the mortality from 23% to 6.3%.

C. I. MacGuire⁴ describes a **portable bed-bath** which he has devised. This is made of a rubber sheet which can be inflated into the form of a tub.

¹ Montreal Med. Jour., Feb., 1899.

³ Zeit. f. diät. u. phys. Therap., vol. ii., part 2.

² Phila. Med. Jour., July 9, 1898.

⁴ Med. Rec., Nov. 19, 1898.

R. P. McReynolds and A. E. Blackburn¹ have treated a series of cases of typhoid fever with **hot mustard foot-baths**. These, they found, reduced the temperature about 0.4° F., and caused improvement in the circulation and increase in the perspiration, with a general feeling of greater comfort. They do not recommend treatment of typhoid fever by foot-baths exclusively, but believe these are useful adjuvants to sponge-baths or tub-baths, particularly when it is desirable to keep the patient very quiet.

J. Eichberg² states that in his hospital service he treats typhoid fever without cold baths, and considers the Brand method "Cruel, barbarous, and dangerous." He uses small doses of **acetanilid** whenever the temperature reaches 103° F. in the mouth. Of 136 cases, all but 6.6% recovered. [This is a small series as compared to the number on record treated by the Brand method; and it will be difficult to convince those of calm mind that heart-depressants, such as coal-tar drugs, can be used safely.]

L. B. Lockard³ advises the **continuous application of ice-bags** for the purpose of reducing temperature. He believes this method especially valuable because it is unnecessary to disturb the patient in carrying it out, and the amount of cold can be regulated very accurately, the number of bags applied being in proportion to the amount of fever. He applies them to the axillas, popliteal spaces, back of the neck, wrists, and ankles.

R. C. Thacker⁴ treated 79 cases of enteric fever with **carbolic acid**, with improvement in the symptoms, but with the certainly not encouraging mortality of 13.9%.

C. Ferreira⁵ reports 6 cases of typhoid fever to which he gave daily 35 to 45 gm. of **asaprol** as an intestinal antiseptic. He considers that the drug had a valuable effect upon the course of the disease.

W. B. Thistle⁶ claims priority in the Woodbridge method of treating typhoid fever, and insists upon the importance of the **eliminative** method of treating this disease, in order, as far as possible, to free the intestines of the bacilli, since he believes that it is at first a local disease. The mortality in the Toronto General Hospital in the past 4 years has been 6.7% in a total of 563 cases. Not all of the cases were treated by this method, however.

M. Richardson⁷ recommends the use of **urotropin** in typhoid fever for the purpose of disinfecting the urine, since he has found in 9 cases that the urotropin destroyed the typhoid bacilli in the urine. In 1 case the bacilli reappeared after the urotropin was stopped, and vanished again when it was again ordered. [This treatment seems unnecessary, as the bacilli rarely cause disease of the urinary passages, and the urine can be easily sterilized after it is voided.]

J. W. Dalglish⁸ describes a case of typhoid fever in which there was excessive abdominal distention, and from which the patient had become practically collapsed. Rectal intubation caused the expulsion of a mass of offensive fluid feces; but there was no relief. The **dilated**

¹ Phila. Med. Jour., Oct. 29, 1898.

² N. Y. Med. Jour., Dec. 10, 1898.

³ Bull. gén. de Thérap., p. 581, 1898.

⁴ Jour. Exper. Med., No. 1, 1899.

⁵ Ibid., Aug. 6, 1898.

⁶ Brit. Med. Jour., Sept. 24, 1898.

⁷ Med. Rec., Sept. 10, 1898.

⁸ Lancet, Oct. 1, 1898.

transverse colon could be seen running across the abdomen, and this was **tapped** by trocar and cannula. A large amount of gas escaped upon withdrawing the trocar and general relief occurred. There was some return of the distention, and one rather severe hemorrhage followed; but finally entire recovery occurred.

J. Ramsay¹ reports recovery in a case of exceedingly severe intestinal hemorrhage during typhoid fever after repeated **intravenous injection** of saline solution.

W. M. Gabriel² records a case of hemorrhage in typhoid fever which had left the man almost moribund and in severe collapse. A pint of normal **salt solution** was given by **enema**, and improvement began almost at once. Six hours later the injection was repeated. The patient entirely recovered.

A. V. Clarke³ reports the use of **antistreptococcic serum** in a case of purulent periostitis which occurred in a boy of 13, during convalescence from typhoid fever. The patient was unconscious and very delirious, and had an extremely irregular temperature when the serum was given. One dose of 10 cc. caused a rapid reduction of the temperature to normal, the delirium disappeared, and the boy became conscious. Similar injections were given repeatedly afterward and entire recovery soon occurred.

E. F. Wells,⁴ in discussing pneumonia as a complication of typhoid fever, notes his treatment of the cases of pneumonia that show severe toxemia. He gives oxygen inhalations and simple dermoeclysis early in the disease; and if these do not cause marked improvement, he practises venesection, which is supplemented by subcutaneous injection of a solution of sodium chlorid, the injection being usually followed a half-hour later by the abstraction of from 4 to 16 oz. of blood.

H. A. Hare⁵ states that **quinin** should always be given hypodermically or intramuscularly in cases of mixed malaria and typhoid infection, as such patients are unable to absorb large doses of the drug when taken by the mouth.

INFECTIONS RESEMBLING TYPHOID FEVER.

S. H. Snell, W. Broadbent, H. R. Smith, and E. D. W. Grieg⁶ describe an anomalous case of continued fever in which there was perforation of the intestine. The patient was a brewer, 45 years of age, whose illness began with general indisposition and diarrhea. The temperature rose to nearly 104° F., then fell, and rose again. Widal's test was negative. The urine contained albumin. The fever continued for about 4 weeks, when the pulse began to increase in frequency, until at the time of death it reached 140 per minute. During the latter part of life there was sloughing of a hemorrhoid. The patient afterward developed tenderness in the right iliac fossa, and mental obscurity, and the picture became that of typhoid fever; but the consultants did not believe it was typhoid fever. At the autopsy there were found 3 perforations of the intestine. There was ulceration of the lower part of the small intestine, but these ulcers were not limited to the lymphoid follicles. Bacteriologic examination of

¹ Intercol. Med. Jour. Austral., Nov. 20, 1898.

² Ibid., Jan. 28, 1899.

³ Phila. Med. Jour., Feb. 25, 1899.

⁴ Lancet, Jan. 21, 1899.

⁵ Am. Therapist, Mar., 1898.

⁶ Ibid., July 30, 1898.

the spleen and of the fluid in the peritoneal cavity showed the presence of pure cultures of the *Bacillus coli communis*, which were virulent when inoculated into guineapigs.

MALTA FEVER.

J. H. Musser and Joseph Sailer¹ describe a case of Malta fever in an American volunteer army-surgeon, a resident of Philadelphia. The disease was apparently acquired in Porto Rico during August, 1898. While there he had been in very damp quarters. The affection began with malaise and headache, and he soon noticed that he had fever. Soon after, a lymphatic gland in front of the ear swelled and afterward suppurated. The fever continued irregularly, and from the time mentioned to the date of the report, Dec. 22, it had shown the wavy course characteristic of Malta fever. **Reaction with the *Micrococcus melitensis*** was positive; while the Widal reaction and examination for malarial parasites were negative. [Subsequently the patient had a renewed febrile attack with hemorrhage from the bowel. This attack was regarded as typhoid in character. The report is one of great interest, as this disease has not hitherto been recognized as one of the fevers of this hemisphere. The serum-reaction and the peculiar clinical course undoubtedly justify the tentative acceptance of the authors' diagnosis.]

E. D. Fitzgerald and E. W. Ewart² report the use of **Malta-fever antitoxin** in the treatment of a case of Malta fever that had previously resisted treatment. Twenty cc. was given repeatedly. One injection about a week after the treatment was begun caused high fever, and the patient became seriously ill with rapid respiration, blood-tinged expectoration, and painful swellings of the joints. There was urticaria of the skin, thought to be due to involvement of the bronchial mucous membrane. This disappeared, however, and afterward the Malta fever vanished.

INFLUENZA.

R. v. Jaksch³ reports a series of **cases resembling influenza** in their onset and course, but in which it was impossible to discover any influenza-bacilli. In most of them streptococci were present. He insists that there is too free use of the diagnosis of influenza, and that in many cases the affection is a streptococcus-infection, or some similar condition which has no direct relation to influenza. [Undoubtedly many widely differing conditions are diagnosed influenza, as the latter is so indefinite in clinical manifestations as to be easily mistaken for other diseases and others for it. The warning regarding diagnosis implied in v. Jaksch's paper is merited.]

W. Whitla,⁴ in speaking of the **pneumonia of influenza**, insists that it is a striking fact that not only is the disease itself contagious, but 1 case of influenzal pneumonia is likely to cause pneumonia in persons coming in contact with it.

H. Oppenheimer⁵ describes 3 cases of influenza in which there was

¹ Phila. Med. Jour., Dec. 31, 1898.

² Lancet, Apr. 15, 1899.

³ Berlin. klin. Woch., May 15, 1899.

⁴ Dublin Jour. Med. Sci., Apr. 1, 1899.

⁵ Lancet, Mar. 11, 1899.

marked **bradycardia** in the early part of the attack, the pulse being lowered to 40 to the minute in 1 case. All recovered without difficulty. He finds bradycardia most common in influenza of the gastrointestinal type. [We have observed in several instances that bradycardia was a pronounced symptom.]

B. Angvan¹ reports a case of influenza which went on to apparent convalescence, but was followed by repeated chills and rise of temperature, and the signs of **mitral endocarditis** developed.

A. Köppen² reports 2 cases of grip which were associated with **hemorrhage from the kidneys**; he also discusses the occurrence of the **diazo-reaction** in this disease. The 2 cases mentioned, which were severe, gave a marked diazo-reaction; 4 other cases of mild character gave slight and transitory reaction. He suggests that the diazo-reaction may be an indication of the severity of the infection. [This cannot, however, be accepted with such slight proof.]

Treatment.—G. Villani³ finds the **hydrochlorate of phenocol** very valuable in the treatment of the fever and pains of grip. It is readily administered even to children, and produces a continuous lowering of the temperature sometimes accompanied by slight sweating. His experience in 400 cases of influenza, giving from 30 to 45 gr. per day, leads him to think that it is almost a specific.

A. Wigglesworth⁴ has used doses of 12½ gr. of **carbolic acid**, given every 2 hours, in the treatment of influenza. He observed no unfavorable effect upon the kidneys or other organs, and claims striking results.

J. C. Ross⁵ has used **cinnamon** in the treatment of influenza, and reports shortening of the attack and rapid convalescence.

MALARIAL FEVER.

Etiology.—P. Manson⁶ writes of the work that has been accomplished recently by Ronald Ross in studying the **relation of the mosquito** to the transmission of malaria. Ross fed gray mosquitos on larks that had been infected with proteosoma. In 1 of 14 of these mosquitos he found **pigmented cells** after his first attempt; and in another experiment he found such cells in 5 of 9 mosquitos. These pigmented cells are believed to be a stage in the life-history of the gymnosporidium, for mosquitos fed on birds infected with halteridium or immature proteosoma, or on healthy sparrows, showed no pigmented cells. Further work by Ross showed that subsequently there was a setting free of **germinal vermicules** into the blood and tissues of the mosquito, so that the first cells described were evidently the primary stage. Finally Ross infected healthy birds by allowing them to eat mosquitos that had fed upon birds infected with proteosoma. The birds that ate these mosquitos showed proteosoma in their blood.

Manson⁷ describes further work done by Ross on the proteosoma. After dissecting the stomach of a mosquito in salt solution, and applying pressure to this placed beneath a cover-glass, he caused rupt-

¹ Wien. med. Woch., Apr. 8, 1899.

³ Gaz. Med. Lombarda, Dec. 19, 1898.

⁵ Brit. Med. Jour., Mar. 18, 1899.

² Centralbl. f. innere Med., May 6, 1899.

⁴ Lancet, Apr. 8, 1899.

⁶ Lancet, Aug. 20, 1898.

⁷ Brit. Med. Jour., Sept. 24, 1898.

ure of the coccidia and the escape of enormous numbers of the germinal rods, thus showing that they came from the coccidia. He found them subsequently in the blood of a mosquito, and after accidentally discovering a gland connected with the proboscis of the mosquito, he found that this gland also contained large numbers of the germinal rods. This, it seemed probable, was the instrument of communication of the disease, and he found that if mosquitos were fed on sparrows affected with proteosoma, and then kept for 5 or 6 days until these germinal rods had developed, and then allowed to feed upon healthy sparrows, these birds subsequently showed large numbers of proteosoma in their blood. The incubation-period of infection in birds seemed to be from 5 to 9 days; the artificial infections being much more severe than those acquired naturally. Proteosoma-infection has also been produced artificially in the crow. The large form of proteosoma, which is not spore-bearing, and from which the flagellated body is developed, appeared in artificial infections only 3 or 4 days after the sporulating forms are seen.

R. Koch¹ reports the results of his commission to study **malaria in Italy**. He found that the parasite causing the disease in Italy is identical with that found in the tropics. There was an especially large number of estivoautumnal cases, while in the tropics the cases are chiefly tertian. This he attributes to the fact that the cases in Italy were seen later in their course, in many instances, than those observed in the tropics; and he states that the fever is first of the tertian type, and in its further course, when influenced by quinin and a partial immunity is produced, the type becomes quotidian, or finally irregular, and that the fever is broken by long intervals. He believes that the differences described between the tropical and Italian parasites depend solely upon imperfect methods of preparation. It has been commonly taught that the half-moon form and the flagellate are degenerated parasites, chiefly because they show no chromatin-staining. By a modification of the Romanowski staining-method, however, he was able to demonstrate chromatin in these bodies, and also the fact that the flagella come directly from the chromatin-bodies, and are themselves composed of chromatin, and not in reality flagella, but seem to be, from analogy with similar parasites, the spermatozoa. He was able to test and to confirm Ross's results in studying proteosoma and the development of these parasites in mosquitos, and has shown that the first stage of its growth in the stomach of the mosquito is the formation of minute worm-like bodies. He has also found the embryos of the coccidia in the poison-glands of the mosquito. The city of Rome is in the middle of a malarial district, but in the inner parts is not subject to epidemics of the disease. This cannot be due to a difference in the water, because this comes from the malarial districts and reaches the city through open conduits; the food comes from the malarial districts, and the air is practically the same. The true explanation seems to be that the inner portion of the city is free from vegetation, and therefore there are no mosquitos. In the winter the number of cases of malaria in the hospitals is small, and practically these are cases of relapse from attacks of the previous summer. A few cases occur in the spring; but suddenly in June the number becomes 5 or 6 times that of the preceding month, and chiefly estivoautumnal. The sudden outbreak is not yet explained. In a note he states that in 2 cases of

¹ Deutsch. med. Woch., Feb. 2, 1899.

malaria methylene-blue was used with very good results, and that this drug has been used in a number of cases in Berlin in which there was a tendency to black-water fever and no quinin could be taken. He has also found in cattle on the Campagna, among which Texas fever existed, a tick identical with that found in Texas fever.

Bignami and Bastianelli¹ have investigated the structure of the semi-lunar flagellate bodies of the malarial parasite, studying the crescents and the flagellates derived from them, as well as those coming from the tertian organism, using Romanowski's method of staining. They found that in most instances the flagella consist of chromatin-filaments. Some of them appear to be protoplasmic bodies containing filaments or blocks of pigment. From these there project 4 flagella made up of protoplasm and containing no chromatin. There are also more numerous flagellate bodies which show a pigmented protoplasmic body with particles of chromatin at the periphery. From the latter there issue chromatin-filaments which make up the chief part of the flagella, which again are usually 4 in number. There are also some flagellates which have flagella containing chromatin, and others that show none. The few isolated stained flagella which they found seemed to be composed of a chromatin-center surrounded by a layer of protoplasm. They believe that the crescents are sterile bodies so far as they are related to man; but that the crescents represent a phase in the life of the parasite which is continued outside of the human host. They consider that this theory is established by the work of Ross and others.

Bignami² adduces very interesting proof of the theory of inoculation of malaria by mosquitos. A man who had been under hospital care for 6 years for a nervous affection, and who had never had any signs of malaria, was placed in a room in which mosquitos collected from very malarious regions of the Campagna were set free. He was repeatedly bitten, and 5 days after the experiment was begun he presented malarial chills and showed parasites in his blood. The species of mosquito to which infection was due was not positively determined. Bignami decides that inoculation by the mosquito has now been demonstrated, and that it is the only form of infection that has been.

C. J. Finlay³ states that the 150 soldiers under his charge during the Santiago campaign were frequently affected with malaria, while mosquitos were entirely absent. He thinks that flies may have carried the disease. He is convinced that the mosquito is active in the transmission of yellow fever, but offers no satisfactory proof of this.

A. W. Elting⁴ has **inoculated** a number of **healthy individuals** with blood taken from those suffering from various forms of malaria. In 4 persons inoculated with blood containing tertian parasites there were 2 positive results. One of the negative cases was afterward inoculated with estivoautumnal blood, and this patient as well as 5 others infected with the latter parasite developed typical estivoautumnal infection. The period of incubation in the tertian infections varied from $1\frac{1}{2}$ to 7 days, and the parasites were discovered in these cases in from 4 to 11 days after infection. The incubation-period in the estivoautumnal infection was accurately determined, and varied from $1\frac{1}{2}$ to 7 days; the

¹ Lancet, Dec. 19, 1898.

² Ibid., Dec. 3 and 10, 1898.

³ Med. Rec., May 27, 1899.

⁴ Zeit. f. klin. Med., Band 36, Hefte 5 u. 6.

average being $4\frac{1}{2}$ days. The parasites appeared in the blood of these individuals in from 3 to 6 days; on an average in 4 days. Elting decides from these experiments and others that malaria is caused by the growth and development of a definite parasite; that there are specific parasites for the different forms of malaria; and that these parasites always retain their form and characteristics. Individuals who receive one form of parasite will show this parasite only in their blood. The parasite may be found in the blood before the first rise of temperature. Infection with the tertian parasite may produce a quotidian or a tertian type of fever according to the number of the embryonal forms. Injection of the estivoautumnal parasite may produce quotidian, tertian, or an irregular type of fever; but the parasite is always similar to the parasite injected. The type of fever produced does not necessarily correspond to the form seen in the individual from whom the blood was taken. In case his blood contained the estivoautumnal parasite, 2 or 3 drops of blood are sufficient to cause infection. Combined infection with the tertian and estivoautumnal forms produced a combination of this infection, and both parasites were seen in the blood. Injections of the half-moon and egg-shaped estivoautumnal parasites into the veins failed to produce malaria.

A. Davidson¹ believes that the malarial parasite runs a double cycle and that other animals may take the place of man as its host. He bases this belief upon the (admittedly uncertain) evidence that the human form of malaria occurs in lower animals, and draws an analogy in regard to the double cycle of the life of the plasmodium by referring to the life of the proteosoma, which has as alternate hosts the mosquito and the sparrow. He is led to consider the possibility that the lower animals suffer from malaria and propagate the disease by the fact that the affection may arise in settlers in countries that had previously been uninhabited.

The Plasmodium.—J. W. Stephens² gives a modification of **Van Ermenger's method of staining flagella**, in which he uses largin, an albuminous silver compound, instead of silver nitrate. Largin contains over 10% of silver, and he therefore uses a 2% solution as a bath. With the exception of the substitution of largin, the method is as Van Ermenger describes it.

T. B. Fletcher³ describes a **rapid method of staining** the malarial plasmodium, which he considers extremely satisfactory for clinical purposes. A smear is fixed in a solution made by adding 4 or 5 drops of a 10% aqueous solution of formalin to 10 cc. of 95% alcohol just before using. The preparation is fixed in this for 1 minute, washed, dried thoroughly, and stained with thionin solution, the stock solution of which is made by saturating 50% alcohol with thionin and adding 20 cc. of this to 100 cc. of a 2% carbolic acid solution, as described by Marchoux. The stain is washed off, the preparation dried, and mounted in balsam.

F. W. Fabricius,⁴ in a study of malaria in Santiago de Cuba, found in the blood from 3 individuals a number of small, motile, **rod-shaped organisms**. These had a peculiar swinging motion in the posterior half; while in the center there was a refractive area which looked like a spore, and this object was repeatedly seen to escape from the rod, and, moving actively, usually penetrated a nearby cell. The rod-shaped

¹ Edinb. Med. Jour., Oct., 1898.

³ Johns Hopkins Hospital Bull., Apr., 1899.

² Lancet, Oct. 1, 1898.

⁴ N. Y. Med. Jour., Apr. 15, 1899.

organism itself multiplied by division. In all 3 cases the plasmodium was present. The character and importance of the organism described are left unexplained.

G. Thin¹ describes a case of pernicious malarial fever in which he observed 2 bodies in 1 red blood-corpuscle, both of which were forming spores. The sporulating parasite of the pernicious fever of Demerara differs from the tertian and quartan forms in both size and number of spores, as do the pernicious forms in Italy and West Africa.

Symptomatology.—D. C. Rees² describes an epidemic of malarial fever which occurred on board ship, and which he thinks was caused either by inhaling the air while the ship was lying at Calcutta, or by drinking the water taken on board there. The incubation-period was about 14 days. He found both tertian and estivoautumnal forms of parasites in the blood. This, he believes, proves that both forms may be acquired from the same source of infection, and that both have the same incubation-period.

F. Smith,³ after studying malaria as it occurs in Sierra Leone, decides that the **negro possesses no immunity** from the disease.

J. Ewing⁴ presents a valuable preliminary report of the results from **800 blood-examinations** at Camp Wikoff. Six hundred and five were cases of malaria. The plasmodium was found in 335 cases; while in the remaining 270 the diagnosis was established by the presence of intracellular bodies altered by quinin, of pigmented leukocytes, or of the anemia of chronic malaria with the clinical appearance of the chronic disease; 85% were of the estivoautumnal variety, 20% tertian, 4% double infections; quartan was very rare; 95% of the men in the general hospital at Montauk had malaria. Negroes seemed to exhibit a distinct immunity, and when infected were not severely ill. Two varieties of **comatose malaria** were observed: one which followed the discharge of a new brood of parasites, which began gradually, increased constantly, and usually ended in death; the blood contained young rings. The other form, of which there were a larger number of cases, began very suddenly. The patients were usually in coma-vigil, but commonly recovered. Usually there were crescents in the blood in these attacks. There were no distinctly algid cases. Among complications were 36 cases of dysentery; intestinal disturbance in general was very common. Nephritis was known to have occurred in 5 cases, and jaundice in 10. Of the entire number of cases, 39 (6½%) were fatal; 25 of these were estivoautumnal infection, and in 10 no distinct variety of infection could be determined. There follows a careful description of the parasites as they occur in these cases. Ewing considers the signet-ring form of the estivoautumnal variety readily distinguishable from the ring form of the tertian, and very valuable in diagnosis. He secured no evidence that the cycle of the estivoautumnal parasite is completed within 48 to 72 hours. Atypical structures were present within the cells very frequently, and he thinks them very important, as are pigmented leukocytes. In no case did he find active malaria and typhoid fever progressing simultaneously; malaria is usually suppressed during the course of typhoid fever.

¹ Brit. Med. Jour., Sept. 24, 1898.

² Ibid.

³ Ibid., Dec. 17, 1898.

⁴ N. Y. Med. Jour., Jan. 28 and Feb. 4, 1899.

F. J. Cotton,¹ in discussing **malaria** as it occurred at **Camp Wikoff**, states that the disease had usually been acquired at Santiago. Most of the patients when seen at Camp Wikoff were convalescent. The privations of the voyage caused a number of relapses, and in 2 cases there was the appearance of sunstroke. In both of these parasites were found in the blood, and in both recovery occurred. In 2 instances there was severe collapse at the height of a paroxysm, and 8 patients became comatose. The latter lay quiet, with no twitching or convulsive movements and without loss of muscular power or muscular tone. The reflexes and sensation were present. One patient was given large doses of strychnin. This caused tetanic convulsions; but he recovered. Quinin administered by the mouth seemed to be of no value. There were a number of cases which presented irregular fever and gave a positive reaction to the Widal test; and although plasmodia were not found, it is considered probable that they were instances of mixed infection.

J. C. Perry,² in discussing the **malarial fevers** of the **Pacific coast**, states that only the milder forms are found, the tertian being the most common; the quartan and estivoautumnal are rare. He describes the most frequent situations of the disease. In the region of the Columbia River and in the Willamette Valley malaria constitutes about 3% of all the diseases coming under observation.

R. A. Goodner³ describes a number of cases of malaria which showed **odd manifestations** of the disease. In 1 case there was dysentery with periodic exacerbations; in 2 others diarrhea: in 1 of the latter the diarrhea was of protracted duration; in the other it was intermittent. There were various other curious conditions noted, such as pains in the knees occurring periodically, leg-ulcers, and urticaria, in all of which the parasite was found, and all of which were cured by the use of quinin.

J. B. Maxwell⁴ records 2 cases of malaria which began with **epileptiform seizures**. Both were men in the second decade of life. Neither had had convulsions before, and in neither did convulsions recur after the use of quinin.

H. F. Hewes⁵ saw in 88 soldiers treated at the Carney Hospital 80 cases of malaria, of which 60 were estivoautumnal, 6 mixed estivoautumnal and tertian, and 6 pure tertian. He speaks emphatically of the gravity of the anemia seen in the estivoautumnal form. He reports that in 1 case during the course of active **typhoid fever** he found the **pigmented malarial organisms**.

H. Jackson⁶ draws attention to the usual **absence of chill** in cases of malaria in soldiers who had been in Cuba.

E. M. Buckingham⁷ believes that of the 400 cases of soldiers seen at the Boston City Hospital, probably all had malaria. He also notes the absence of chill and the occurrence of violent paroxysms in several instances after convalescence seemed established. Diarrhea was almost a constant symptom. As **distinctive from typhoid fever**, which these malarial cases usually resembled greatly, he considers a combination of high fever with marked remission and much enlarged spleen, diarrhea, and brightness of the intelligence of marked importance. Later in the

¹ Boston M. and S. Jour., Dec. 15, 1898.

² Med. News, Dec. 17, 1898.

³ Boston M. and S. Jour., Dec. 8, 1898.

⁴ N. Y. Med. Jour., Dec. 3, 1898.

⁵ Med. News, Sept. 10, 1898.

⁶ Ibid. ⁷ Ibid., Nov. 3, 1898.

case the negative result of the Widal test is of marked value. He saw frequently the type of weak heart previously described by DaCosta as present in many soldiers.

E. W. Wynkoop¹ believes that many cases of malaria occurring in soldiers were considered typhoid fever. He describes the course that the Southern malaria and fever generally take. The theory of the transmission of this disease through the mosquito he considers to some extent controverted by the testimony of the soldiers, who state that they found very **few mosquitos in Cuba**. Malignant malaria is believed to have caused many sudden deaths of soldiers while on furlough.

T. Hitzig² has studied the character of the **urine in malaria**, and found the quantity increased during the fever and the specific gravity low. The maximum quantity was passed during the stage of fever. The total nitrogen was increased during the fever, and the urea bore a resemblance to the total nitrogen. The ammonia was increased during the fever, and the proportion of ammonia to total nitrogen was abnormally high. The uric acid was about normal. Potassium and sodium were excreted in increased amounts during the fever. The chlorids showed the same increase, but were much decreased after the fever had passed. The phosphates were much decreased during the fever, but increased afterward.

W. S. Thayer³ contributes an elaborate article on **nephritis of malarial origin**, based upon the cases which he has observed in the Johns Hopkins Hospital. In 758 cases of malaria he saw albuminuria in 46.4%, while tube-casts were present in 17.5%. Albuminuria occurred in over half the cases of estivoautumnal infection, while in the intermittent cases it was present in somewhat more than one-third of the number. Acute nephritis was observed in between 1% and 2% of the entire number of cases seen at the hospital, while it was present in 27% of all the cases treated in the wards. In the estivoautumnal form 4.7% had nephritis. He therefore decides that this complication, while not so common as in some of the other infections, occurs quite frequently, and particularly in tropical countries it may be of importance in causing chronic diseases of the kidneys.

G. Marinesco⁴ reports an interesting case. A woman of 80 was admitted with quotidian fever and with hemiparesis of the right side of the face, and a **paraparesis** affecting most pronouncedly the right leg. The reflexes were exaggerated. The patient died in coma, with subnormal temperature. In the posterior segment of the internal capsule were found 3 small areas of softening. Microscopic examination showed the capillaries of the brain-substance filled with red corpuscles containing plasmodia. The pigmented corpuscles were present in such masses as to obliterate the lumen of the vessels. This was most marked in the arterioles of the left lenticular nucleus. There were no hemorrhages, and the tissues in general showed no lesions, excepting some of the spinal ganglia, which showed solution of the granules.

P. K. Brown⁵ describes an interesting case of **combined malarial**

¹ Med. Rec., Sept. 24, 1898.

² Deutsch. Arch. f. klin. Med., Band lxii., Hefte 3 u. 4.

³ Am. Jour. Med. Sci., Nov. and Dec., 1898.

⁴ Compt. rend. de la Soc. de Biol., Mar. 18, 1899.

⁵ Phila. Med. Jour., Dec. 31, 1898.

and **Staphylococcus-albus infection**. The symptoms from the beginning resembled typhoid fever. There was a small furuncle on the chest, which spread rapidly and was operated upon, the pus yielding the *Staphylococcus albus*. Malarial plasmodia were found in the blood at this time. The induration on the chest became much more marked. The patient exhibited more profound intoxication, and died in delirium, with high temperature. The autopsy showed some nephritis, there were hemorrhage areas in various tissues, and cultures from the blood yielded the *Staphylococcus albus*. This, in Brown's belief, is the first case of fatal *Staphylococcus albus* septicemia.

Hemorrhagic Forms.—R. M. Conally,¹ in discussing **blackwater fever**, describes 3 types—the **sthenic**, the **insidious**, and the **pernicious**, and gives cases illustrating these. In the sthenic the attack comes on with severe symptoms—fever, intense pain, violent vomiting, and tenesmus; the urine is red; there is usually a remission within a day, and then the stage of prostration appears, which commonly is followed by some improvement in about 12 hours, unless the case is a fatal one. The insidious type resembles remittent fever at first; but toward the third day the urine becomes scanty and the patient shows jaundice, and then symptoms similar to those previously described appear, and the stage of collapse soon follows. The pernicious type is characterized by violent onset, with rapid, full pulse, jaundice which soon becomes intense, and subsequent suppression of urine. There is frequently some appearance of improvement, which is soon followed by increase in the symptoms, and the end commonly comes in convulsions or coma; or, if the case is more prolonged, the individual becomes cold and collapsed. There is usually a horrible sense of weakness and terror in such attacks.

F. P. Mackie² describes a case of blackwater fever which occurred in a missionary who had been in Africa and who had previously had the affection. This attack came on after riding a bicycle against a strong wind. There were vomiting and fever, and the next day severe chills. The chills and vomiting continued, and on the third day the urine became black. The next day the vomiting and chills disappeared, the temperature became normal, and the urine gradually acquired a normal color. The blood-examination was practically negative, excepting for the appearance of a number of very pale corpuscles and a few intracorpuseular bodies, which stained faintly and had delicate flagella. In the urine there were many clusters of oval, transparent bodies, which stained with methylene-blue and reproduced by budding. These have been observed before, but their importance is unknown.

G. Thin³ records a case of blackwater fever in which **parasites** identical in appearance with those of malaria were found **in the brain**. He thinks that there is no evidence that this disease is due to a special form of parasite, and considers it the result of the action of an especially virulent plasmodium.

L. W. Sambon,⁴ in discussing **blackwater fever**, states his belief that this is **not a manifestation of malaria** or of a condition due to the administration of quinin in malaria. He believes that the distribution of the disease is not analogous to the distribution of malaria.

¹ Brit. Med. Jour., Sept. 24, 1898.

³ Brit. Med. Jour., June 3, 1899.

² Lancet, Dec. 6, 1898.

⁴ Ibid., Sept. 24, 1898.

Estivoautumnal fever is commonly considered to be the cause of blackwater fever; but the latter begins with a severe paroxysm, while estivoautumnal fever does not. Blackwater fever also is accompanied by marked leukocytosis, while uncomplicated malaria is not. He also believes that quinin is harmless in blackwater fever, and that this is evidence against its malarial origin. The fact that malarial parasites are often found he considers a coincidence, and he believes that the occurrence of blackwater fever after the use of quinin is often a coincidence, and that quinin causes the affection only through acting as a depressing agent, as do fatigue and chill. [These views will receive little support from authorities, and are, at the least, unproved.]

Treatment.—F. P. Lynch,¹ in a general article on **blackwater fever**, says that the treatment should consist of the use of calomel and of sweating the patient by rolling in blankets and surrounding him with hot-water bottles. Antipyrin should be given in large doses to reduce the fever, the heart should be stimulated, and as soon as the temperature begins to lower **quinin** should be given and continued. This treatment, he says, resulted in the cure of 17 of 18 cases in which it was used.

W. H. Crosse² states that his 9 years' experience on the west coast of Africa leads him to decide positively that quinin must be given in full doses in blackwater fever, and if the stomach will not retain it, it must be administered hypodermically. The prostration resulting from the hemorrhage must be treated in the usual way.

R. U. Moffat³ insists that Koch is wrong in stating that blackwater fever is really quinin-poisoning. Moffat thinks that much harm may arise from such a statement, as it is, in his opinion, through quinin only that the disease can be treated with any success. Of 9 cases that he has treated, 2 died, and in both of these quinin was given only late in the disease. The other 7 received large doses of this drug.

Z. Lewkowicz⁴ has tried **analgen**, **phenocoll**, **chinopyrin**, and **euchinin** as antimalarial drugs. Euchinin is readily taken, since it lacks the bitter taste of quinin, and he finds it a very useful drug. Chinopyrin is recommended for hypodermic use. The other 2 mentioned are considered useless.

W. H. Thomson⁵ reports that in a number of cases of Cuban malaria quinin, arsenic, and Warburg's tincture were found inefficient; and recovery ensued in almost all cases soon after administration of a mixture of **quinin**, **ginger**, and **paregoric**. He believes that the antiperiodic element in opium is probably narcotin. He states that in 6 cases malarial and typhoid infection existed together. In 4 of them the malaria disappeared during the typhoid, while in the other 2 it reappeared after recovery. Baths which contained salt and carbolic acid seemed to lower the temperature more rapidly than simple cold baths. It was found that the amount of urine was increased in a number of cases by injecting salt solution, at a temperature of 104° F., into the rectum.

A. Jeffrey⁶ gives powdered **myrrh** combined with **quinin** and **licorice** in the treatment of malaria, and claims that this causes increase

¹ Med. News, May 27, 1899.

³ Brit. Med. Jour., Sept. 24, 1898.

⁵ Med. News, Dec. 17, 1898.

² Lancet, Mar. 25, 1899.

⁴ Wien. klin. Woch., Oct. 13, 1898.

⁶ Med. Rec., Aug. 20, 1898.

of the white blood-corpuscles. These are believed to act as scavengers of the blood, and the result is considered to be a much more effective control of the malaria than that with simple quinin.

C. N. B. Camac¹ reports a case of peculiar **idiosyncrasy to quinin**. The patient developed annular scotoma after having taken 6-gr. doses of quinin 3 times a day until 36 gr. had been taken.

F. Donaldson,² from his experience with the Rough Riders, states that quinin, when used in the low form of malaria which affected many of the men, and which is often associated with much disturbance of the gastrointestinal tract, usually disagreed badly and often produced severe vomiting. Such cases did better upon the use of proper treatment of the digestive organs and suitable diet, without giving quinin at first.

H. W. Lewis³ believes that **quinin** should be given in **malarial hemoglobinuria**, while the toxemia should be combated by subcutaneous or high rectal injection of normal salt solution. T. N. White and J. J. Mann⁴ oppose the use of quinin.

P. L. Bellenger⁵ reports 2 cases of malaria in which hemorrhage occurred after the use of quinin, but he believes that the drug was not responsible in either of the cases. In the first case quinin was used subsequently without ill-effects; and the second was one of a series of 20 cases of malaria in which quinin was used, and none of the others showed any hemorrhage.

H. A. Hare,⁶ in discussing the use of quinin in malaria, states his belief that it may act injuriously at times, since he has shown that it causes 'congestion of the kidneys in normal animals. Malaria unquestionably does this also, so that the addition of the effect of quinin to that of malaria may sometimes be very harmful to the kidneys. He believes, however, that it is useful to prevent future attacks of hemoglobinuria, and sometimes it is necessary to use this drug in even grave malaria with jaundice and hemorrhagic tendency. But if possible other drugs should be used first.

F. G. DuBose⁷ describes his treatment of so-called malarial hematuria. In 10 cases he has had no deaths when using hypodermics of morphin and atropin, followed by repeated doses of calomel. Perhaps the most important element of the treatment was the use of large amounts of skimmed milk and of **saline enemas**.

Valvassori-Peroni⁸ describes most successful results from the subcutaneous use of **ferrous arseniate** in obstinate cases of malaria which did not yield to quinin. The solution contained 5 cg. of ferrous arseniate to the cubic centimeter, and the dose used was from one-fourth to one-half a syringe-ful.

A. Jacobi⁹ advises the use of **ergot** in many cases of chronic malaria. He states that his experience teaches him that many chronic cases showing enlargement of the spleen resist the action of quinin, arsenic, methylene-blue, and other drugs, but yield to ergot, the spleen being reduced in size and the attacks often disappearing before any diminution in the

¹ Med. Rec., Oct. 8, 1898.

³ N. C. Med. Jour., Mar. 5, 1899.

⁵ Med. Rec., Feb. 18, 1899.

⁷ Jour. Am. Med. Assoc., Mar. 11, 1899.

² Med. News, Oct. 15, 1898.

⁴ Ibid.

⁶ Ibid., Jan. 7, 1899.

⁸ Gaz. degli Ospedali, Dec. 20, 1898.

⁹ Med. News, Oct. 23, 1898.

size of this organ is noted. The plasmodia do not disappear so rapidly as after the use of quinin when the latter is effective, but the patient gains strength rapidly even while they remain present. Sometimes it is advisable to combine the ergot with quinin or arsenic. In some instances the ergot, probably, he says, by causing sudden contraction of the spleen and driving large numbers of plasmodia into the circulation, may bring on attacks of chills and fever. Malaria that has not become chronic is not well suited to the use of ergot.

T. Lascarato¹ advises the use of **berberin** in the treatment of malarial enlargement of the spleen. He states that it causes marked contraction of the organ. This may be so energetic as to cause rupture of the spleen; therefore the drug should be used cautiously. It may be given in as large a daily dose as 15 gr. At first, it is said to cause a paroxysm by driving the parasites into the general circulation.

L. Rogers² has found that Kala-azar and severe epidemic malarial fever may sometimes be entirely stamped out by moving all the healthy people in an infected village to a new site, even though the new location may be only a few hundred yards from the old.

CEREBROSPINAL FEVER.

General Considerations.—Councilman, Mallory, and Wright³ contribute a most interesting study of this disease, with reference to its history, general characters, and clinical and pathologic relations, based upon observations in 111 cases occurring in hospitals in Boston. The epidemic of 1897, during which this study was made, centered in Boston; but, as was shown by the replies to letters of inquiry sent by the authors, extended also to other parts of the State of Massachusetts. It is impossible to do more than review the principal conclusions. The disease is described as an acute infection produced by a peculiar micrococcus—the meningococcus. This organism, first recognized and described by Leichtenstern, was carefully studied by Weichselbaum. The authors consider it the specific organism, and admit no other in the etiology of the disease. The pathologic seat of the disease is the meninges of the brain and cord. Though the portal of entrance is unknown, the possibility of entrance from the nasal mucous membrane is considered. In a number of cases identical organisms have been found in the nose, associated with inflammatory lesions; but such organisms have not been cultivated, and have been found in various diseases. It is possible that the organisms reach the nose secondarily after infection of the middle ear. The meningeal lesions are restricted to the pia-arachnoid, and consist of or assume a purulent character. Secondary invasion of the substance of the brain and cord is habitual even to the depth of the ventricles in the brain. In part, these deeper lesions consist of purulent infiltration around the bloodvessels, and in part, and more diffusely, of proliferative changes in the neuroglia and degenerative changes in the ganglion-cells and nerve-fibers. The organisms are usually abundant in acute cases, but may be missed in the more chronic. The most certain method of diagnosis is

¹ *Grèce méd.*, Jan., 1899.

² *Brit. Med. Jour.*, Sept. 24, 1898.

³ "Epidemic Cerebrospinal Meningitis, and its Relation to Other Forms of Meningitis." Report of the State Board of Health of Massachusetts, Boston, 1898.

lumbar puncture; but the authors point out the necessity of great care in attempting culture from spinal fluid, recommending the use of large quantities of fluid. The operation was performed in 55 of their cases, and sometimes several punctures were made. In 38 cases diplococci were found either in the microscopic examination or in the cultures. In 17 cases they were absent. Early in the disease the fluid obtained is more or less clouded with pus-cells. Later, the liquid is clearer and culture or microscopic examination is apt to be negative. During exacerbations of the disease positive results are more likely to be obtained than during the remissions. One of the striking peculiarities of the disease is the tendency of the inflammatory lesions to extend centrifugally along the nerves. This extension involves the optic, the auditory, and the fifth nerves particularly, and explains the occurrence of purulent inflammations of the eye and middle ear and of inflammatory swelling of the Gasserian ganglion. Infection of the lung occasionally occurs; and the authors call attention to a peculiar form of pneumonia, of which the characteristic is a tendency to the formation of several foci or areas of consolidation. Such a lesion was observed in 8 of their cases. As to the symptomatology, they note that there are no prodromes; the onset is sudden, with emesis, pain in the head, and stiffness, pain and muscular contractions of the neck, extending to the back-muscles and, later, to those of the lumbar region; there is usually delirium; in many cases unconsciousness passes into deep coma. The complications, as noted above, are numerous, and, among others, they refer to joint-lesions, which, however, they cannot explain upon the basis of their own observations nor the experience of others. Degenerative lesions of the nerves were found in all the cases in which they were looked for. As to the contagiousness, they note that the general opinion is that the disease is not propagated by contagion. "The evidence, on the whole, is that the disease is incapable of being transmitted from one individual to another." There were, however, in this epidemic several instances in which 2 persons came from 1 house and family; and their opinion is that the possibility of contagion is greater than has been usually believed. The mortality in the epidemics they studied was 68%, 76 of their 111 cases having died. The epidemics usually last more than a year, and then slowly decrease; but the disease does not disappear. They hold that there is ground for assuming that many cases of sporadic meningitis are of the epidemic form. The methods of treatment, according to their review of the literature, seem to have but little influence upon the mortality. The disease is rare in persons over 35 years of age. The authors then refer to a number of cases of meningitis due to other causes. Among these causes, the tubercle-bacillus, the pneumococcus, and the streptococcus are the most important. In 1 case with imperfect history there was a mixed infection with the *Bacillus pyocyaneus* and *Staphylococcus aureus*; in another case the infection was due to the anthrax-bacillus. The pneumococcus has been regarded as the cause of epidemic meningitis, because of its having been first detected in cases of meningitis secondary to pneumonia and acute endocarditis. In their reports they find 10 cases in which the pneumococcus occurred, and was so associated with the lesions of the disease that it could be regarded as the cause. In 8 of these cases the meningitis was secondary, but in 2 there was fracture of the base of the skull, including the temporal bone;

and the organisms evidently entered from the middle ear. Pathologically, there is a distinction between pneumococcic and streptococcic meningitis and epidemic meningitis, in the existence of marked acute endarteritis in the first two. This resembles the vascular process discovered also in tubercular meningitis. The gross lesions in the pneumococcic and the streptococcic forms are very similar. Tuberculous meningitis is dismissed with a few words, as its pathology is quite well-known. Their case of anthrax-meningitis occurred in a man, 40 years of age, a teamster, engaged in handling hides. A carbuncle in the neck was removed. Infection probably occurred through the alimentary canal, from the patient's habit of putting his fingers in his mouth to feel an inflamed tooth. At the autopsy there were 13 carbuncles in the intestinal canal, and acute hemorrhagic meningitis. The exudate was distinctly hemorrhagic, and the specific bacilli were found in the tissues.

Osler,¹ in his Cavendish lecture, delivered before the West London Medical and Chirurgical Society, June 16, 1899, discusses cerebrospinal fever, basing his observations on a recent epidemic in and around Baltimore. Referring to the disease as an epidemic, he notes that it is one of the most fatal of all acute diseases, though it fortunately takes an humble place as a destroyer on account of its comparative infrequency. He refers to the high mortality in the recent Boston epidemic. The outbreaks are apt to occur in waves or periods; and the author quotes from the recent collective investigation of Surgeon-General Wyman of the Marine Hospital Service,² in which the prevalence of cerebrospinal fever during the past year in 27 States and in the District of Columbia is referred to. The movement of troops through the country does not seem to have had any influence. The localization of the disease in one city or in the neighborhood of one city is commented upon; and its limitation to one section of the city, as at Philadelphia and Washington, is referred to. The similarity of pneumonia and cerebrospinal fever in the matter of epidemicity is of more than passing interest, though the analogies are less close than is maintained by those who believe in the identity of causation. The author is entirely in accord with most other recent writers in regard to the meningococcus as the specific cause. This organism was found in a large proportion of his cases. In all, there were 21 cases, and lumbar puncture was performed in 16. In 3 cases, seen in consultation, the diagnosis was so clear that this operation was not performed. In 2 cases, both mild in character, puncture was made early, and no organisms were discovered; and in 2 other cases the patients were observed so late in the disease that it was considered unnecessary. Of the remaining 14 cases, the *Diplococcus intracellularis* was present in 13 in cover-slips and in cultures. In the remaining case the presence of the organism was doubtful on the cover-slip, and the *staphylococcus* grew in culture. In 1 case the meningococcus was found in the blood. Regarding some peculiar features observed in the study of the microorganisms, we may refer to the following: Capsule-formation was never observed; nor was it ever possible to stain the organisms by Gram's method in any case unassociated with other pyogenic organisms. There was never any resemblance in the blood-serum culture to the pneumococcus. There was great variability of the organisms; but it was notable that

¹ Phila. Med. Jour., July 1, 1899.

² Public Health Rep., vol. xiv.

when there is condensed water in the culture-tube living organisms are found in the latter, though the cultures upon the solid medium have died out. They did not obtain the chain referred to by Jäger in the exudates; but it was common to find chain-formation with the unstained light line of cell-division running parallel to the long axis of the chain on blood-serum growths. "Attempts to isolate this specific organism from any other site than the spinal fluid and the meninges of the cord and brain have in every case been attended with failure;" but in another place the author says that "the heart's blood of this case failed to give a positive result at autopsy, although during life the organism had been isolated from the blood as well as from the joint-lesions." The pneumonic areas in the lungs have always contained the pneumococcus, either alone or with pyogenic staphylococci. In regard to the microbial associations, it is of interest to note that the pneumococcus, pyogenic cocci, *Bacillus coli communis*, and the tubercle-bacillus have been discovered. In chronic cases the *Diplococcus intracellularis* may not be present, having been displaced by secondary invaders. Passing from the etiologic features to the matter of diagnosis, the author first offers a classification of the various forms of acute meningitis, which is here reproduced.

ACUTE LEPTOMENINGITIS.	Primary.	{	1. Of cerebro-spinal fever.	{	(a) Sporadic.	} Diplococcus intracellularis.		
					(b) Epidemic.			
					Meninges alone involved or in a gen-eral pneumococcus-infection.			
	Secondary.	{	2. Pneumo-coccic.	{		} Pneumo-coccus.		
					1. Tuberculosis		. . . . .	Bacillus tuberculosis.
					2. Pneumo-coccic.		(a) Secondary to pneumonia, endocarditis, etc.	} Pneumococcus.
							(b) Secondary to disease or injury of the cranium or its fossæ.	
					3. Pyogenic.		(a) Following local disease of the cranium or a local infection elsewhere.	} Various forms of staphylococci and streptococci.
							(b) Terminal infection in various chronic maladies.	
					4. Miscella-neous acute infections.		In typhoid fever, influenza, diphtheria, gonorrhœa, anthrax, actino-mycosis, and other acute diseases.		} Typhoid bacillus, influenza-bacillus, diphtheria-bacillus, gonococcus, etc.

He states that the acute primary leptomeningitis, in a large proportion of all cases, follows infection with the meningococcus or the pneumococcus. No attempt has been made to classify in this table Quinke's meningitis serosa.

With regard to the clinical features, he calls attention to the abrupt onset which distinguishes this form from the tuberculous. There is no definite fever-curve, the temperature usually being quite irregular; sometimes, however, it resembles closely that of typhoid fever; at others, the curve suggests tuberculosis, and occasionally malaria. Of skin-rashes, the most frequent was herpes, which was present in 8 of the author's cases. A diffuse erythema was observed in 4 cases; petechiæ in 8—extensively in 3; and in 3 cases a remarkable rash was found about the joints, particularly over the extensor surfaces of the knees and elbows and about the ankles. This was a diffuse erythema with purpuric herpes. Leukocytosis was also present in his cases; but on analysis of

11 cases of tuberculous meningitis he found that this feature would not serve as a distinguishing mark. In 2 cases arthritis or peri-arthritis was noted. Lumbar puncture was practised in most of the cases, as stated above. In 2 cases improvement was noted after withdrawal of fluid; 1 case is given in detail, and illustrates the striking improvement noted after puncture, though the final conclusion arrived at was that the variability was due rather to the natural fluctuation of the disease than to the effect of the puncture. Regarding lumbar puncture, the author states that "during the past 10 years no single measure of greater value in diagnosis has been introduced than Quinke's lumbar puncture. . . . It is a simple, quite harmless procedure, and in the majority of cases can be done without general anesthesia and with the aid of a local freezing-mixture. A dry tap is rare in cerebrospinal fever. The needle may be plugged with fibrin, or a nerve-root may come directly against the orifice." Kernig's sign was present in all cases. Referring to the existence of sporadic cerebrospinal fever, the author points out the great variability in the terms used to designate different forms of meningitis. The experience at the Johns Hopkins Hospital is then cited. In the spring of 1898 the first cases of the epidemic form were admitted to that hospital. Prior to that date only 4 cases which Osler regarded as cerebrospinal fever had been admitted—3 within a few days of each other in 1893, and 1, a chronic case, in 1892. When these cases occurred the disease was not prevalent in Baltimore, and was not epidemic anywhere in the country except in New York. Three days after the death of the first case of the 1893 series, a lad was admitted with a remarkable family history of the disease: 1. A son, aged 20, returned to his home, Feb. 7, with a "terrible pain in his head," and suffering great pains and vomiting; he became delirious, and died on the 12th. 2. A sister who helped to nurse him was taken ill on the 15th, and after a similar illness died in 4 days. 3. A second sister became affected a few days later, was desperately ill for 2 weeks, then improved, and completely recovered. 4. The mother, worn out with nursing the children, was taken ill on the morning of the 17th, and died 2 days later; she had slept in the same bed with No. 5—the case that was admitted to the hospital.

Etiology.—Hünemann¹ reports the results of his study of an epidemic of cerebrospinal meningitis. He found with difficulty in many cases microorganisms similar to the *Micrococcus intracellularis*, and in some cases small bacilli. The cultures yielded by the cocci, however, were similar to those of the ***Staphylococcus pyogenes aureus***. In cover-glass preparations from cultures of the staphylococcus, Hünemann has occasionally found cocci arranged in chains similar to those seen in growths of the meningococcus. He therefore believes that the micro-organism found in these cases was the staphylococcus, showing a special form, and considers that there is absolutely no proof that the meningococcus is a special bacterium. The bacillus found in 5 cases was very similar to the bacillus of influenza, though it was not considered identical with it. [These results are so at variance with the great mass of authoritative work on epidemics, that it seems likely the staphylococcus and meningococcus were confused. This is not improbable in the light of

¹ Zeit. f. klin. Med., Band xxxv., Hefte 5 u. 6.

the recognized difficulty of distinguishing the two organisms in some cultures.] W. G. Buchanan¹ observed in India 3 cases of cerebrospinal fever. In 1 case a diplococcus corresponding in its appearance with the meningococcus was discovered in the exudate from the cerebral and spinal membranes. He thinks it probable that the infection in this disease was from either the nose or the lungs, since the diplococcus has been found in both situations.

A. H. Wentworth,² in discussing epidemic cerebrospinal meningitis, states that he believes **lumbar puncture** one of the most accurate methods of diagnosis in use at the present time. With care in the introduction of the needle one rarely fails to obtain fluid; and if failure occur, one should first pass a wire through the needle, and if this does not cause fluid to appear, the needle should be withdrawn a little and thrust in again more toward the median line, as it probably has not penetrated the dura. The gross appearance of the fluid is not sufficient for a diagnosis; there should be a microscopic and bacteriologic examination before even the diagnosis of meningitis may be considered established.

W. Osler³ records 2 cases of cerebrospinal fever which were **complicated by arthritis**. One case, which was fatal, was seen in a man, 24 years of age. In this case there were chill, fever, and active delirium, with stiffness of the neck and purpuric eruption of the skin. The spleen enlarged, and there was multiple arthritis. Lumbar puncture showed that the meningococcus was present in the meningeal exudate obtained, and it is notable that the organism was shown to be present also in the blood. At the postmortem there was found a purulent meningitis along the brain and cord, pneumonia of both lungs, and purulent arthritis. The second case had involvement of a number of joints successively, and there was fever, but no headache. Typhoid fever and acute rheumatism were considered; but on the fifth day and subsequently the patient had pain in the back with retraction of the head, stiffness of the neck, and some delirium. Subsequently there was paraplegia, and lumbar puncture showed numerous diplococci in the thick, creamy pus removed. The cord was exposed by laminectomy, the pus drained away, and a catheter was introduced under the dura. Irrigation was carried out with normal salt solution.

H. D. Rolleston and H. W. Allingham⁴ describe a case of cerebrospinal meningitis in which the condition became so grave that operation was undertaken, and after **laminectomy** drainage was established in the lower dorsal region. When the dura was opened about 3 oz. of fluid escaped; improvement occurred. When the discharge became less free the patient grew worse, but improved repeatedly after free discharge. The tube was left in 6 weeks, after which it was removed, and the patient gradually recovered almost entire health. [This operation has been undertaken in a number of cases of which we have knowledge, but in none except that referred to was the result favorable.]

Diagnosis.—Osler⁵ refers to cases of meningitis met with in the pathologic service of the Johns Hopkins Hospital, in which bacteriologic examination was made. There were 6 cases of cerebrospinal fever, 8 of pneumococcic meningitis, 7 of pyogenic meningitis, and 4 miscella-

¹ Brit. Med. Jour., Sept. 24, 1898.

³ Boston M. and S. Jour., Dec. 29, 1898.

⁵ Phila. Med. Jour., July 1, 1899.

² Lancet, Oct. 1, 1898.

⁴ Lancet, Apr. 1, 1899.

neous forms, in 2 of which unidentified bacilli were discovered. No case of primary staphylococcic meningitis came to autopsy, though some of the chronic cases of cerebrospinal fever presented only the pyogenic organisms when bacteriologic examination was made. Pneumococcic meningitis occurred in several forms: 1, as a complication of lobar pneumonia; 2, as a result of local infection; and 3, as a primary meningitis. Four of his cases belonged to the first group, and there was general infection with the pneumococcus, but it is excluded because only a partial autopsy was performed. Referring to the clinical features of the first group, the author draws upon Nauwerck's interesting contribution, based upon 29 cases. All of the cases of Nauwerck were over 20 years of age. In only one-half the disease was latent. Special symptoms are rare. Strabismus was present in one-fifth of the cases, and ptosis only once. Headache and early delirium, deepening into unconsciousness, are present in all cases. The importance of lumbar puncture is insisted upon by Osler. The almost universal character of the pneumococcic variety is a striking point of difference. The author has never seen recovery in pneumonia complicated with meningitis.

YELLOW FEVER.

P. E. Archinard, R. S. Woodson, and J. Archinard¹ report their results in 39 autopsies in yellow fever and the clinical examination in these cases, particularly referring to the value of the **agglutination-test**. In autopsies upon 39 cases, they found in 32 a bacillus similar to the *Bacillus icteroides*; it was found in pure culture but twice. They believe that it differed in some essential characteristics from the colon-bacillus. It was found in the blood of 4 or 5 cases examined, and was also discovered repeatedly in the exhaled breath and in the sweat. It was virulent when injected into guineapigs, a dose of 5 to 10 cc. of culture, however, being usually necessary to cause death. In a few points the bacillus differed from that described by Sanarelli. In over 80% of the cases agglutination occurred with the blood of those sick with yellow fever or recently convalescent. When diluted as much as 1:40, blood from cases of typhoid fever, dengue, malaria, and a number of other diseases did not react; neither did normal blood. The agglutinative principle was still present in most individuals who had had yellow fever in 1878; when the disease had occurred prior to that time no reaction was obtained.

Symptomatology and Diagnosis.—H. A. West² contributes a further paper (see YEAR-BOOK for 1899) upon the question of the existence of yellow fever in Texas in 1897. He made a collective investigation by writing to a large number of physicians in Texas. As a result, he is convinced that the epidemic that occurred followed the movement of troops and visitors, and was therefore infectious and carried by previously infected individuals. Eruptions were present in about three-fourths of the cases, but hemorrhages were seen by practically all observers, and severe nausea and vomiting were present in more than 80%. Jaundice was very frequently seen, albuminuria was present in a large number of cases, and uremic symptoms were common. A secondary fever

¹ N. Y. Med. Jour., Jan. 28, 1899.

² Jour. Am. Med. Assoc., July 16, 1898.

was observed, however, in very many of the cases. The decision that West reaches is that dengue and mild yellow fever can be separated only with the utmost difficulty or not at all, and that both may be present at the same time. He believes that there was unquestionably yellow fever present in 1897. The differential point between the diseases is the occurrence in yellow fever of severe nephritis, with albumin and casts in considerable quantity. He believes that the differential diagnosis between dengue and yellow fever must be carefully studied and largely rewritten. J. Cargill¹ describes a case of yellow fever which occurred in a young Russian woman, who slept in a room in a lodging-house in which an individual had died shortly before from yellow fever. The room had been aired subsequently, but not disinfected. The next morning, after a horseback journey of 13 miles, she became faint, and vomited. After a few hours the vomit became black; anuria was noted, and subsequently hemorrhage from the urinary tract. She died suddenly the next day.

H. P. Jones,² in considering the conditions existing in the army in Cuba, notes the almost universal prevalence of diarrhea, while scorbutic symptoms were frequently seen at first, but were controlled by the men themselves by eating limes and fruit. Jones treated 185 cases of yellow fever, with 20 deaths. There were 4 cases of this disease complicated by typhoid and malaria; of these 4, 2 died, and in the 2 fatal cases he found **malarial organisms** in the blood before death, and the typical lesions of both **typhoid fever and yellow fever** after death. The other most common diseases treated were typhoid fever, dysentery, and malaria.

D. J. Spotswood³ places the **death-rate** of yellow fever in private practice at less than 10%. He considers a bloated, debauched appearance of the face important in diagnosis. He frequently finds albumin absent from the urine. He insists that the paroxysm of fever is by no means always over within 72 hours, in spite of the statements of some writers.

W. Nelson⁴ discusses yellow fever. He believes that **albuminuria** is a pathognomonic symptom of the disease. In distinguishing malaria from yellow fever he uses the therapeutic test, giving 16 gr. of quinin sulphate and 2 drams of sodium sulphate every 3 hours until 3 doses have been taken. In yellow fever he uses vapor-baths, mineral acids, and sinapisms in the treatment; the temperature he controls with an ice-bag. He states that Domingos Fierré was the first to investigate the bacteriology of yellow fever, and that Fierré has produced a fluid, inoculation with which will cause a mild grade of yellow fever in man and will produce immunity.

S. Warren,⁵ in speaking of the fevers found in the South, says that the most common one is that called **sun-fever**, which resembles both malaria and yellow fever. In both yellow fever and sun-fever there is injection of the conjunctivæ; but in yellow fever, of which Warren saw but 4 instances (while he met with as many as 120 cases of fever daily), the injection is of a pale-yellow color, diffuse, and gives the eye a vacant

¹ Brit. Med. Jour., Sept. 24, 1898.

² New Orf. M. and S. Jour., Feb., 1899.

³ Med. News, Oct., 1898.

⁴ Med. Rec., Aug. 6 and 13, 1898.

⁵ Med. News, Aug. 27, 1898.

look, so that it somewhat resembles a sightless eye. This he considers a certain sign. In sun-fever the injection is bright red and the expression is that common in fever-patients. Vomiting occurs in both: in yellow fever without relation to the taking of food; while in sun-fever it always follows the ingestion of food or drinking-water. Malaria and sun-fever resemble each other in that both have high temperature and chills. In malaria, however, there are usually both a morning and an evening rise of temperature; while in sun-fever there is rarely a morning rise, and the evening temperature is usually 1.5° to 2° F. higher than in malaria. The chill differs also: in malaria there is a rise of temperature; followed by fever and sweating; in sun-fever the chill comes on with the fever and there is no sweating stage. Sun-fever is not confined to those unacclimated, the natives suffering from it also, but to a considerably less extent, because they expose themselves little to the mid-day sun and do little work. The treatment most frequently efficacious is a full bath or sponge, followed by Epsom salt in repeated doses until copious watery stools are produced; calomel, oil of turpentine, and large amounts of water with lime-juice should be used. Warren does not believe that enteric fever is a disease indigenous to Cuba; but he believes that it certainly is likely to prevail in epidemic form in Santiago, as the city has long been in an extremely unsanitary and overcrowded condition.

Treatment.—E. Wasdin¹ used **Sanarelli's serum** in treating 3 cases of yellow fever. The first case reacted at once by a rise of temperature and increase of pulse-rate, together with marked superficial congestion, these symptoms being followed by decided improvement. The effect of subsequent injections was less marked, and the influence of the serum was thought to have been no greater than that of ordinary medication. The second case was not improved more than commonly occurs after the usual treatment; and the third case, which was very severe, resulted in rapid death from uremic coma.

W. Nelson² treats yellow fever by the administration of **quinin and sodium sulphate**, and by hot-air baths, followed by ice-packs if the temperature becomes excessively high. An abnormality of convalescence frequently noted by him was marked bradycardia.

THE BUBONIC PLAGUE.

P. L. Simond³ gives a study of the **method of dissemination** of bubonic plague, and shows that the disease spreads from an infected human being only under peculiar circumstances, the most favorable of which seems to be infection of rats. The disease may be traced in its epidemic course by following the migrations of rats. The appearance of a second epidemic about a year after the first seems to be due to reinfection of a new generation of rats, and it is well determined that the rats become infected from each other chiefly through fleas.

R. Koch⁴ discusses the **spread of the bubonic plague**. In Asia there are 3 endemic foci—Mesopotamia, Thibet, and Assir; but there is in Africa a previously unsuspected focus. In his recent journey through East Africa Koch investigated a disease which he found was present in

¹ Med. News, Dec. 3, 1898.

² Med. Rec., Aug. 6, 1898.

³ Ann. de l'Inst. Pasteur, part 12, 1898.

⁴ Deutsch. med. Woch., July 14, 1898.

Kisibi, but which really originates in the nearby English territory of Uganda. It is extremely fatal, and in the tissues of those dead of the disease he found the plague-bacillus, as he did in the bodies of rats dying at the outbreak of the epidemic. Rats are very plentiful in the district in which the plague exists, and this is added evidence of the relation of these animals to the spread of the disease. This focus of plague is of serious importance, because of the fact that a railroad is likely to be built connecting the East Coast with Uganda. E. L. Marsh¹ gives the record of plague in the hospital at Poona during the period from June 1, 1897, to Mar. 31, 1898; 4179 cases were treated for plague within that time; 2836 died, 1310 recovered, and 33 were still in the hospital at the time of writing the report. The mortality was nearly the same in males and females; while in children it was from 12% to 15% less than in adults. The bubonic cases were not so fatal as were the nonbubonic—*i. e.*, those of the pneumonic or septic type—nearly 75% of the latter perishing. Of the hospital staff, which numbered from 140 to 300 persons at various times, 26 contracted plague, and 14 of these died. Buboes were most common in the left femoral region; inguinal buboes were comparatively few in number; while the axillary and cervical glands showed enlargement with great frequency. Curious sequels were occasionally seen, and among the most common was a peculiar disturbance of speech, which consisted of an odd drawl and inability to frame certain words; often the voice changed considerably, and resembled that of a boy at the age of puberty. Treatment was directed almost entirely toward the support of the circulation. Haffkine made a number of inoculations, operating upon every alternate case, and comparing those inoculated with those treated otherwise; his results were very disappointing. Of 61 cases that were inoculated, about 80% died; while in the uninoculated the mortality was 77%. Two cases that had received prophylactic treatment were admitted with plague, but both of these cases had been inoculated 9 months before their admission. F. G. Clemow² presents a study of the recent epidemic of plague in Calcutta, which began by the recognition of the first case on April 16, 1898, and up to July 31 there had been 190 cases reported. Probably some cases had occurred before April 16. It affected all but 7 of the 25 wards of the city, and caused a panic among the inhabitants and the outbreak of several riots in which some murders were committed. A number of officials were killed in an attempt to carry out Haffkine's prophylactic inoculations. The infection probably came from trading-ships. Clemow believes that the women of India are more likely to become infected with plague, as they are much confined to the house and often engaged in polishing brass with dirt taken from the floor of the houses. The mortality in the epidemic was 82%.

Clemow³ also records his experiences with the **plague-serums** of Yersin and Lüstig. The former was used in 50 cases, and 50 control-cases were compared with these. The mortality was the same in both series; in 6 cases the serum was injected almost directly after the appearance of the disease, and all of the cases died. He thinks that Yersin's

¹ Glasgow Med. Jour., Jan., 1899.

³ *Ibid.*, May 6, 1899.

² Lancet, Sept. 17, 1898.

serum cannot be depended upon to give good results. The effects from Lüstig's serum in a small number of cases were not encouraging.

RELAPSING FEVER.

H. Löwenthal¹ treated a large number of cases of relapsing fever with **antispirechetic serum**, which he obtained from a horse which had been treated with blood containing the spirochetæ; 131 cases were so treated, and but 1 of these died, while 47 % showed no relapse. Of 152 not treated in this way 10 died, and only 12.8 % recovered with but 1 attack, while 32.9 % had 2 attacks and 46.5 % had 3 attacks. In those that were treated with serum the average duration of the disease was 7 days shorter.

VACCINIA.

J. S. Billings, Jr.,² has studied the effects exerted upon the morphologic elements of the blood by vaccination. He did not find the small bodies showing ameboid movements that have been described, but there was a moderate degree of leukocytosis, reaching its maximum at the time of maturation of the pustules. There was no characteristic alteration in the numbers of the different forms of leukocytes.

R. J. Carter³ contributes a paper on **vaccination-rashes**, dividing them into 2 groups—those occurring from the inoculation of vaccine-virus and those due to secondary infection. In the first group are certain eruptions that occur before the vesicles form. These may be vesicular, bullous, or in the form of erythema multiforme, the 2 latter forms being rarely mentioned by writers. There may be forms of roseola, morbilliform rashes, and various kinds of lichen. Psoriasis is very rare; while eczema is extremely common, though it must not be attributed to the vaccination unless it appears before the vaccination is healed. Syphilis has been attributed to vaccination in far too many cases, and it must be remembered that unless an interval in the neighborhood of 50 days passes between the inoculation and the appearance of the rash, the vaccination probably had no other relation with it than to cause a somewhat earlier outbreak of previously existing syphilis. Tuberculosis and syphilis should in the future be excluded entirely by the use of glycerinated calf-lymph.

VARIOLA.

R. H. Thomson and J. Brownlee⁴ describe a **peculiar infectious disease** which occurred in Lascars, and which bears a resemblance to both variola and varicella. It differs from smallpox in the appearance of the rash at the time of the onset of the general symptoms. While there is no secondary fever, the eruption has no special predilection for the face and scalp, but appears chiefly on the arms, chest, and back, and the palms and soles are entirely free from the eruption. The papules became changed rapidly in many cases into vesicles, but true pustules did not form; also 3 patients who suffered from this disease had already had small-pox, and 4 were revaccinated with success during the course of the disease, and the others had been revaccinated shortly before the disease occurred.

¹ Deutsch. med. Woch., Oct. 27 and Nov. 3, 1898.

² Med. News, Sept. 3, 1898.

³ Lancet, Aug. 20, 1898.

⁴ Ibid., Oct. 22, 1898.

The resemblance to chicken-pox was often striking ; but the papules were larger, harder, and more shotlike, and had a dusky-red color, and in the majority of cases did not vesiculate until the second or third day. There was frequent eruption in the throat, and catarrh of the pharynx was common. A white areola also appeared about the points of eruption. The drying of the vesicles went on very slowly and was accompanied by deep pitting ; and again the frequent onset, with high fever, vomiting, and pain in the back, was also unlike the onset of varicella.

E. R. Bishop¹ records a curious **epidemic of smallpox** which began in a travelling theatrical troupe. The first case became infected in Kentucky, in Mar., 1898, and a number of members of the troupe subsequently acquired the disease in various parts of the country, the first case appearing in Charleston, W. Va. Since the disease was mild the first patient and others afterward affected kept at work, and spread the disease widely, leaving a trail of infection throughout a considerable portion of New York State, 160 cases in all being known to have arisen from this source. The epidemic was finally controlled in Geneva by putting the whole troupe on a steamer and mooring the vessel in the lake.

J. F. McConnell² reports his observations in an epidemic of smallpox which occurred in New Mexico. **Conjunctivitis** was an almost constant complication, and a macular measles-like eruption almost always appeared before the typical rash. Many Mexicans who had not been vaccinated had a mild disease which clinically resembled varioloid.

H. Roger³ describes 2 cases of smallpox which occurred in adults who had been recently vaccinated ; in fact, in 1 case the smallpox developed coincidently with the vaccinia. Both cases began with severe symptoms, which lasted only a very short time. The subsequent course was extremely mild, and in each case only 2 pustules could be found. He found albuminuria rare in the nonfatal cases of smallpox.

J. Gonaud,⁴ in studying the **prognostic value of the fever** in variola, found that cases of even moderate severity may have high temperature ; while in severe hemorrhagic cases the fever is frequently but slight. The latter cases are usually fatal. The pulse is a much better prognostic indication than the fever.

TYPHUS FEVER.

J. W. Ross⁵ discusses the epidemic of fever which occurred at Key West, Fla., in Aug., Sept., and Oct., 1898. He decides that it was neither yellow fever nor dengue, and believes that it more closely resembled exanthematous typhus than any other disease. Patients had severe pains in the back ; the pulse was almost always slow ; the tongue dry and covered with a white or brownish fur. An eruption occurred in one-fourth of the cases ; albuminuria in about the same number. Epistaxis was frequent. The spleen was often enlarged, and there was pronounced debility. The disease appeared with a sudden chill, and was sometimes preceded for a few days by anorexia and malaise. The temperature rose rapidly and remained high for 1 or 2 days, subsequently declining slowly

¹ Buffalo Med. Jour., Jan., 1899.

² Jour. Am. Med. Assoc., Feb. 18, 1899.

³ Rev. de Méd., May, 1899.

⁴ Thèse de Lyon, 1898-99.

⁵ Med. Rec., Dec. 24, 1898.

and reaching the normal in about 7 days. [The diagnosis is certainly far from clear.]

STREPTOCOCCUS-INFECTION.

H. Roger¹ describes the case of a man of 25, who had a false membrane over the whole interior of his mouth and pharynx, excepting on the tongue, over both conjunctivæ, and obstructing the external urinary meatus, while his general condition was good and he had but slight fever. Cultures showed a streptococcus.

ERYSIPELAS.

C. W. Allen,² in reporting his treatment of 100 cases of erysipelas, says that in over 50% the **entrance of infection** was through some skin-defect, while in 9 cases the throat was at fault, in 3 it was due to a nasal catarrh, and in 2 to a lacrimal fistula. He has found that nasal disease of some kind exists in practically all cases in which there is not a defect of skin or throat to account for the infection; he believes that in facial cases infection very frequently takes place through the nose. He therefore applies a 50% watery solution of ichthyol to the nose over every part that can be reached, and over the affected skin-surface applies a 25% solution of ichthyol in collodion. His results are said to be surprisingly good; and in the prevention of recurrence he states he has had entirely successful results from careful attention to the condition of the nose.

Chantemesse,³ in studying the **leukocytes in erysipelas**, found that during the course of the disease there was a marked increase, which was followed by an abrupt diminution in their number with cessation of the disease. There was no eosinophilia, the chief increase being in the polynuclear forms.

A. A. Eshner⁴ records 2 cases of what he diagnosed as **protracted erysipelas**. In the first there were redness and puffiness of the face about the nose, without any distinct line of demarcation. The swelling had been present for 3 months, and was at first attended with fever. The second case occurred in a boy who had abscesses of the head associated with puffiness, induration, and redness of the face. This persisted for some time, and a characteristic erysipelatous eruption appeared. In both cases he used pilocarpin in the treatment, and considered it very successful.

G. Monteux⁵ records a case of acute **articular rheumatism** which occurred with an attack of erysipelas. The patient had previously suffered from acute rheumatism, and when taken with his attack of erysipelas had seemed to be improving markedly. On the sixth day he showed swelling of the knees, which had been affected in the previous attack, and also involvement of the ankles. Within 3 days there was a general polyarthrititis with redness and swelling affecting both the small and the large joints, and giving way almost at once upon the administration of salicylates; when the dose of salicylates was reduced the articular

¹ Rev. de Méd., May, 1899.

³ Compt. rend. de la Soc. de Biol., Feb. 18, 1898.

² Med. News, Apr. 8, 1899.

⁴ Medicine, Apr., 1899.

⁵ Rev. de Méd., Jan., 1899.

swelling became apparent once more, and again subsided upon further dosage with salicylates. Ten similar cases are recorded from the writings of others; and Montoux states his belief that this is not a general infection with the streptococcus of erysipelas, but is a combination of typical rheumatism with erysipelas, basing this belief especially upon the facts that the individuals showed a rheumatic disposition; that large and small joints throughout the body were affected; and that the rheumatic symptoms disappeared rapidly under the influence of salicylates. [The difficulty in distinguishing secondary infectious arthritides from acute articular rheumatism is well illustrated by this case. The therapeutic test and the distribution of the joint-disease will not alone suffice to make the distinction.]

Toussaint¹ reports the occurrence in a tuberculous young man of a pneumonic consolidation of one apex followed by a widespread facial erysipelas. The pneumonia underwent rapid resolution, but the erysipelas spread widely, finally subsiding after the use of **Marmorek's serum**.

J. L. André² reports 5 cases of erysipelas in which Marmorek's serum was used with success. The temperature fell by rapid crisis. The interesting fact was noticed in 1 case that the objective appearance of the disease continued for several days after the temperature had become normal and the patient was subjectively well.

W. Koelzer³ has used **metakresolanytol** in the treatment of erysipelas, in solutions of 1% to 3% strength, painted on by means of a brush, at first for from 20 to 30 minutes, subsequently for 10 to 20 minutes, this application being repeated about every 2 hours. It usually caused rapid recovery in human beings, and also in the disease experimentally produced in animals.

N. Raw⁴ describes 11 cases of grave acute streptococic infections in which he used antistreptococic serum; 6 cases recovered and 5 were fatal. He believes that the serum should always be used if the streptococci are found in the blood or discharges of any severe cases; but he does not recommend it unless these organisms are found. He has seen no ill-effects from its use.

STAPHYLOCOCCUS-INFECTION.

H. Wohlgenuth⁵ reports a peculiar case of **protracted staphylococcus-infection** which began in 1892, after an operation for hemorrhoids, and continued until the time of the report. There were numerous abscesses formed successively, and many curious symptoms, among which may be mentioned repeated hemoptysis, marked emaciation, and general signs arousing the suspicion of tuberculosis of the lungs. Subsequently a chronic osteomyelitis of the spinal column developed, and gave rise to the signs of a compression-myelitis; this, however, disappeared upon treatment. Another attack of compression-myelitis occurred directly after the report was prepared, and within 5 days had caused complete

¹ Gaz. hebdom. de Méd. et de Chir., July 24, 1898.

² Arch. de Méd. et de Pharm. mil., No. 11, 1898.

³ Deutsch. med. Woch., Oct. 27, 1898.

⁵ Berlin. klin. Woch., Sept. 5, 1898.

⁴ Lancet, July 9, 1898.

paraplegia and a large bed sore. The symptoms rapidly improved, and soon after the patient was in his usual condition.

PNEUMOCOCCUS-INFECTION.

W. H. Brodie, W. G. Rogers, and E. T. E. Hamilton¹ describe a **peculiar epidemic** which they observed among the Kaffirs employed in the mines of South Africa. In all cases there was a somewhat profuse purulent discharge from the nose. In most cases pneumonia developed, and often there was sudden and unexpected death without any previous satisfactory evidence of local disease. Sometimes there were dysenteric symptoms, sometimes severe parotitis, at others evidence of meningitis. The pneumonia was often limited; and the patients frequently continued at their work while the disease was in progress. Dysentery was the most common immediate cause of death. The actual symptoms of cerebral meningitis were not common, but in most instances there was extensive purulent exudate found upon the meninges at the postmortem, the pus most commonly entering through the course of the sphenoidal sinus and being found chiefly over the base of the brain. Spinal meningitis also was found in 2 of 5 cases in which it was looked for. The pneumonic process was lobar, and accompanied in all instances by more or less pleurisy. There were complete bacteriologic examinations in 15 cases. In 7 of these an organism corresponding to the pneumococcus was obtained; in 8 cases no cultures developed. They think that the organism they obtained was identical with the pneumococcus, but more virulent, and that it was the cause of the cerebrospinal meningitis. It is believed that the pneumococcus first produced the lesions in the nose, and that subsequent extension took place from here; and they consider that the septicemia produced by the pneumococcus from pneumococcic rhinitis is not infrequently sufficient to cause death, often when severe local secondary effects, such as meningitis-pneumonia, are absent. It is thought that some of the fulminating attacks of cerebrospinal meningitis that earlier authors described were of this nature. They believe that further investigations will show that a general infection by pneumococci often occurs through the medium of a specific rhinitis.

H. Roger² reports the case of a woman with measles and with severe bronchitis who gave birth to an 8 months' child that died a few hours afterward. Cultures from the **blood of the fetus** showed a **pneumococcus** in pure culture, while the sputum of the mother contained the same organism, thus proving the case an instance in which a mild infection in the mother caused fatal disease in the fetus.

WEIL'S DISEASE.

H. Picard³ records a case of Weil's disease which occurred in a man of 46, after drinking water from the river Rhine. He believes that the disease was due to **infection from the water**. The case was notable for the severe diarrhea and vomiting and because of the occurrence of suppression of urine and muscular cramps, the latter being in his belief

¹ Lancet, Oct. 22, 1898.

² Revue de Méd., May, 1899.

³ Berlin. klin. Woch., Nov. 2, 1898.

the result of the loss of water through the discharges. There were also the unusual symptoms of xanthopsia and widespread skin-eruption. After repeatedly improving and relapsing the case resulted fatally.

RABIES.

F. Cabot¹ records 15 cases of suspected rabies, of which 14 recovered under treatment with the **Pasteur method**. In 12 of these instances inoculation of preparations of the spinal cords of the dogs that had bitten the patients produced rabies in guineapigs. Cabot states that the autopsy alone is insufficient to establish a diagnosis of hydrophobia. He reports 4 cases *in catenso*, the common characteristics being that the patients were severely bitten; that an interval of from 4 to 11 weeks occurred; that there was then a very violent illness, characterized by convulsions, dyspnea, and salivation, with a rapid pulse, clear mentality, and no tendency to bark nor bite. Cabot presents testimony of the value of the Pasteur treatment of rabies. He quotes numerous veterinarians who are united in believing that rabies is a distinct and characteristic disease that occurs with some frequency in the United States. He has investigated the effect of cauterization of the inoculation-wound in experimentally inoculated guineapigs, using fuming nitric acid, the actual cautery, silver nitrate, and simple swabbing of the wound. Somewhat more than 90% of those cauterized with fuming nitric acid recovered, while a lesser percentage recovered with the other methods. He therefore decides that nitric acid is the best method of local treatment.

C. Gerstmeier² records a case of **hydrophobia** that occurred in a child, 6 weeks after being bitten by a dog. There were convulsions excited by very slight irritation, difficulty in mastication, and great terror. The spasms were relieved by applications of cold to the spine, but death soon occurred.

J. J. Ligget³ records a case that he diagnosed **hydrophobia**. It began about a year after the man had been bitten by a dog, and there were such severe spasms that it required a number of men to hold the patient in bed. He attempted to bite those about him, and forcibly ejected saliva from his mouth during the spasms. He was wholly conscious in all the attacks, and always predicted the occurrence of the next. He was treated by the administration of 260 gr. of calomel in a little over a day, and entire recovery ensued. [The diagnosis of cases like the above is always a matter of great doubt. Many cases of hysterical pseudohydrophobia are doubtless called true rabies.]

THE SLEEPING-SICKNESS.

Patrick Manson⁴ gives an interesting description of 2 cases of sleeping-sickness. The patients had been brought to London from the south bank of the Lower Congo, where the disease is very prevalent. The first case was that of a boy of 20, who had been unusually bright until 19 years old, when he became listless, neglectful, and finally unfit for work, and increasingly drowsy until he slept most of the time. He had had no

¹ Med. News, Mar. 18, 1899.

³ Ibid.

² Ibid.

⁴ Brit. Med. Jour., Dec. 3, 1898.

convulsions and no maniacal attacks. He had constipation; but his digestion seemed good and his appetite was normal. The blood-examination showed a normal number of red cells and 60% of hemoglobin. His senses seemed to be of normal activity and the reflexes were normal; but his grasp was weak, he was readily fatigued, and seemed very melancholy, and almost always lay as though asleep. He had some enlargement of the lymphatic glands. There was some loss of flesh and of muscular power. In the second case there was a severe pruritus; there was also enlargement of the lymphatic glands and of the spleen and liver. The hemoglobin was reduced. This boy slept almost constantly, and had to be fed by the nurse, as he was so drowsy that he would fall asleep while attempting to eat. In both cases the *Filaria perstans* was found in the blood in large numbers; malarial parasites were absent. Both cases showed the *Ascaris lumbricoides*, *Ankylostoma duodenale*, and *Tricocephalus dispar* in their stools. The second case improved considerably upon arsenic and plenty of warmth and good food; the liver and spleen decreased largely in size, and his drowsiness became much less. The average duration of this disease is 9 months. Manson suggests that the pituitary body is the original seat of the disease, and in support of this suggestion mentions a postmortem record in which the pituitary body was found enlarged. A. T. Ozzard¹ believes that cases coming from British Guiana diagnosed sleeping-sickness are errors in diagnosis, since he has never met with the disease in that colony.

TRICHINOSIS.

W. Osler,² in discussing the **clinical features of sporadic trichinosis**, reports 5 cases observed in the Johns Hopkins Hospital within 2½ years. He divides the clinical features of the disease into those connected with the growth and development of the parasite in the intestine, and those which follow the migration of the young brood into the muscles. In the several days preceding the sexual maturity of the larvæ and the birth of the embryos the patient usually has considerable nausea, vomiting, diarrhea, and colicky pains in the abdomen, and sometimes in epidemics the disease becomes choleraic in character. Gastrointestinal symptoms are not always present in noteworthy degree; they varied in the cases reported, and were severe in but 1 case. At the period of invasion most of the patients complain of peculiar muscular and joint-pains, chiefly in the legs, and of heaviness and aching in the limbs. Fever appears, and the case is likely to be mistaken in many instances for typhoid. This was particularly marked in the first and fifth cases reported. The second case presented a course of fever that was typically intermittent, and aroused a strong suspicion of malaria, but the parasites were not found. The pulse was proportionate to the fever, while the respirations were likely to be excessively rapid. Epistaxis was seen twice. The diazo-reaction was marked in 3 cases upon admission, and in 1 other case developed later in the disease; while in the fifth case the reaction was suspicious. Three features are considered of great value in diagnosis. These are the pronounced muscular pains and swelling, the edema in the eyelids and over the eyebrows, and the leukocytosis, and

¹ Brit. Med. Jour., Apr. 22, 1899.

² Am. Jour. Med. Sci., Mar., 1899.

especially the high degree of **eosinophilia** which was present in all these cases. The leukocytosis practically excluded uncomplicated typhoid fever, and the eosinophilia was always so marked as to arouse a suspicion of trichinosis after this had been observed in the first case. A. D. Atkinson¹ reports a case of trichinosis in which the diagnosis was suggested by the discovery of an eosinophilia of 58.5%. The patient's symptoms were edema of the eyelids, fever with sweats, and intense muscular pains. Trichinae were found in sections made from a portion of excised muscle. The fresh teased specimen showed no trichinae, and examination of such preparations is considered insufficient. T. R. Brown² reports an additional case of trichinosis, in a boy of 13, in which the diagnosis was suggested by the observation of an eosinophilia of 48%. Examination of a portion of muscle that was removed showed recent myositis and the presence of numerous young nonencapsulated trichinae. There was still some eosinophilia several months after all symptoms had subsided.

T. R. Brown,³ in answering a query of Cabot's, concerning the **duration of the eosinophilia** in cases of trichinosis, states that one of his cases was discharged from the hospital in January, and had no leukocytosis when examined in July. He notes the probability of a considerable duration of the eosinophilia.

GLANDERS.

H. F. Lainé⁴ directs attention to the frequent occurrence of glanders in horses in **Havana**, and the neglect of any isolation of these animals. As a result, he has observed **human glanders** in a number of instances, and considers this disease an element of danger to the public health in Cuba.

Sharkey⁵ describes a case of glanders which occurred in a man of 32. The course was chronic, and somewhat resembled typhoid fever; but the Widal reaction and the diazo-test were both negative. Rheumatic pains in the abdomen, right thigh, and calf had been the first complaint. Subsequently there was inflammation about the right tibia, and a sore on the arm, which was thought to be syphilitic, and which showed slight improvement under the use of potassium iodid. Pains appeared in several joints and in the eyes, and there was a swelling on the right side of the face, which became pustular, and was followed by similar swellings elsewhere, some of which broke down and formed ulcers. These were seen both on the skin and on the mucous membrane of the mouth and nose. Death finally occurred, preceded by delirium. There were numerous grayish-white nodules found in the lungs and pleura; these yielded cultures of the **Bacillus mallei**. There were a few ulcers in the stomach. The whole course was between 4 and 5 months.

J. Batco⁶ describes 4 cases of **human glanders**. The first occurred in a hostler, who acquired the affection from horses. He conveyed the disease to his wife and 2 children, himself and wife showing severe bron-

¹ Phila. Med. Jour., June 3, 1899.

² Boston M. and S. Jour., Sept. 1, 1898.

³ Lancet, Sept. 24, 1898.

⁴ Med. News, Jan. 7, 1899.

⁵ Surgeon-Gen.'s Rep., 1898.

⁶ Wien. klin. Woch., Oct. 20, 1898.

chial catarrh, while in the children the disease was mild. Injections of mallein gave no good results, and were therefore relinquished.

W. Rose¹ describes a case of **chronic glanders** which was finally cured by repeated operations. It began with abscesses on the forehead, right arm, and right leg; suppuration continued over a long period, but there was little depression of the general health, and thorough operation resulted in cure. The diagnosis was readily established in this case, since the patient had been working among horses, several of which had glanders.

LEPRA.

I. Dyer² gives a **historical study of leprosy** as it has occurred in Louisiana. He decides that the disease has existed in that State probably since 1750, and certainly since 1778; and while since that time there has been no instance of importation of the disease, there is good evidence of its having been acquired in many cases by contact. In 61 instances there was constant exposure to contagion; in 45 instances parents and children were affected. The distribution of the disease is chiefly in the neighborhood of the old leper-hospital. The anesthetic form of the disease predominated.

H. M. Bracken,³ in studying **leprosy in Minnesota**, found that the largest number of lepers ever known to have been living in that State was 21; 13 are there at present. The impression that all cases originated in the Norwegians is erroneous, since 5 of the 11 cases placed on record in the last 2 years were from Sweden. Bracken believes that the family history of all immigrants from a country where leprosy prevails should be investigated before they are allowed to embark for this country. He believes that the subjects of the disease should be segregated, but thinks that leprosy is dying out in Minnesota, even without segregation. The most satisfactory method of caring for them would, in his belief, be a home under the control of the Federal government. Under this plan the various State laws would not interfere with their segregation in some parts of the country. There is no evidence of sterility in the subjects reported by Bracken, since there are 9 families recorded in which the children numbered from 4 to 8.

W. T. Corlett⁴ was informed by Robelin that there are at least 200 cases of **leprosy in the city of Havana**, and that the disease probably exists in corresponding numbers throughout the island of Cuba. He attempted to learn whether the lepers were excluded from tobacco-factories; but while he found none engaged in the work in these places, he could not see any satisfactory evidence of their exclusion therefrom.

R. S. Chew,⁵ in a study of the **contagiousness of leprosy**, insists that he has been unable to elicit any satisfactory evidence of contagion in his study of 1034 cases. He mentions a number of instances of leprosy in prostitutes who came in sexual contact with large numbers of men, and in none of these instances could any contagion be traced.

Samgin⁶ records a case of **anesthetic leprosy** which began with **chronic rhinitis**, followed by anesthesia; the latter finally became almost

¹ Lancet, Oct. 1, 1898.

³ Ibid., Dec. 17, 1898.

⁵ Med. Age, Dec. 27, 1898.

² Phila. Med. Jour., Sept. 17, 1898.

⁴ Southern Med. Rec., July, 1898.

⁶ Deutsch. med. Woch., July 28, 1898.

complete. There was paralysis of both facial and both ulnar nerves, the latter being so much thickened as to be palpable. Death was caused by amyloid disease of the kidneys. Microscopic examination showed atrophy of the glands of the skin and of the hair, with round-cell infiltration, and in the latter there were some giant-cells. Infiltration was slight in the areas longest affected, and lepra-bacilli were few in number in the older areas of infiltration; there was an interstitial inflammation of the ulnar and peroneal nerves, affecting the perineurium, the epineurium, and the endoneurium, the myelin of the nerves having almost entirely disappeared. Bacilli were rare in the nerves. There was no leprous infiltration of the spinal cord, but secondary ascending degeneration was found, especially in Goll's columns in the cervical region. There was much pigmentation of the cells of the spinal ganglia and some hyperplasia. Lepra-bacilli were not found in the central nervous system.

V. Lieberthal¹ reports a case of leprosy which occurred in Chicago in a man who was a native of Greece. **Leprous tubercles** developed gradually after a severe burn which occurred 6 years before the time of the observation of the case. The patient thought that the burn had been active in causing the disease. Lepra-bacilli were found in the nodules.

H. L. Wagner² describes a case of **leprous ulcer of the lip** which occurred in a middle-aged man who was an excessive smoker. An ulcer appeared on his lips, and was thought to be syphilitic, but scrapings from it showed large numbers of lepra-bacilli. The man had lived for some time in China. After the first examination he disappeared from observation.

O. Lerch³ records a case of leprosy of the unusual **pure trophic form**. The man, who was born in Ireland and had been living in New Orleans for 50 years, presented excessive dryness, rawness, and scaliness of the skin, which could be raised from the underlying tissues in large folds, and resembled a thin alligator-skin. The nails were rough and thickened and markedly deformed. The lesions were practically solely of trophic character. The affection was of 18 years' duration, and was recognized only through chance admission to the hospital.

BERIBERI.

F. Grimm⁴ discusses beriberi, noting that it occurs in temperate and cold climates as well as in the tropics. While its nature is not thoroughly understood, it is certainly more than a simple peripheral neuritis, and is apparently infectious, though one attack does not confer immunity. He describes the disease as beginning with increased pulse-frequency, irritability of the heart, dyspnea, and epigastric oppression, though other authors describe a form in which all signs of cardiac involvement are absent in the early stages at least. Later, muscular soreness and paresthesia appear; there are edema over the tibia and puffiness of the face, and the temperature rises. In the further course he describes 2 forms, **beriberi simplex** and **beriberi accumulatum**: the first showing but a single attack, which may persist for several months, but commonly ends in either death or entire recovery; while in the second form, which is

¹ N. Am. Pract., July, 1898.

³ New Orl. M. and S. Jour., May, 1899.

² N. Y. Med. Jour., Oct. 15, 1898.

⁴ Deutsch. med. Woch., July 21, 1898.

often fatal, there are usually repeated attacks with intermittent fever and, frequently, complications. In considering the **prophylaxis** of the disease, he directs especial attention to the fact that so long as Europeans adhere to European diet, they do not acquire the disease; that the disease disappeared from the Japanese navy after the diet was regulated upon European principles; and that it also disappeared from Japanese penal institutions after careful regulation of the food. It seems to bear little relation to the use of rice, but is more closely connected with the taking of sea-food.

G. Norman¹ discusses **beriberi** as it occurs in **temperate climates**. He first notes the remarkable variations in the prevalence of the disease. The disease commonly occurs along the coast in the different countries in which it appears. He describes 3 epidemics which have occurred at the Richmond Asylum, in Dublin. The following symptoms were considered diagnostic: Edema of the shins without albuminuria; pain in the legs; anesthesia of the skin of the legs; rapid and irregular heart-action. It was often noticed that the heart was beating strongly while the pulse was exceedingly feeble. The area of cardiac dulness was enlarged, and the enlargement often took place with great suddenness. The peroneal muscles showed loss of power first, then the flexors of the foot; wrist-drop was uncommon. Contracture of the lower extremities was seen a number of times. The joints became greatly relaxed, probably because of muscular wasting and relaxation of the ligaments. The earliest symptom was painful formication, followed by anesthesia; and Norman especially notes that about the anesthetic area there was usually a zone of marked hyperesthesia. Anesthesia of the pharynx was found in a number of cases. Edema was practically a constant symptom, but in some cases was exceedingly slight. It often varied strikingly with change of posture, and sometimes disappeared with astonishing rapidity. Electric changes were sometimes detected, and sometimes not; and if present they usually disappeared early. If atrophy was present in marked degree, reactions of degeneration were usually discovered. Postmortem examination showed no central lesion; while the peripheral nerves showed parenchymatous degeneration and interstitial proliferation. Bacteriologic examinations were negative, and the etiology of these epidemics remains unknown. The mortality of the 3 epidemics was 8.23%.

W. G. Ellis² writes that beriberi has long been **endemic in the Singapore Asylum**, having in 1897 caused 60% of the total deaths. Most of the cases were of the moist variety; that is, accompanied by edema and showing weakness or absence of the knee-jerks, but no tenderness, anesthesia, or muscular atrophy; improvement and relapse repeatedly occurred, and death was finally brought on by edema of the lungs, pericardial effusion, or persistent vomiting. In this case the degeneration was found in the pulmonary or cardiac sympathetic nerves, or in the phrenics. In no fatal case was such degeneration absent. The bacillus of Pekelharing and Winkler was never found, and bacteriologic investigations were always negative. The heart in fatal cases was always large; the spleen likewise. In 125 fatal cases edema of the lungs was found; in 78 pericardial effusion; in 87 the stomach was excessively congested. Ellis attributes the ordinary cause of beriberi to **degeneration of**

¹ Brit. Med. Jour., Sept. 24, 1898.

² Lancet, Oct. 15, 1898.

the peripheral nerves; while the moist cases are believed to be due to **degeneration in the sympathetic system**, the phrenic and the vasomotor nerves, death occurring when the phrenics, vagi, or the cervical sympathetics become seriously affected.

E. C. M. Smith¹ reports a number of cases of **beriberi** which occurred on board a ship on which an epidemic had occurred 2 years before. All the patients recovered, with 1 exception, who died suddenly during convalescence.

UNCLASSIFIED FEVERS.

In a discussion on the **unclassified fevers of the tropics**, A. Crombie² divides them into the nonspecific and the specific groups. The fevers of nonmalarial type and of continued course are chiefly climatic fevers, due to overexertion in the heat. They last from 1 to many days. Examples of this class are called ardent fever, siriasis, heat-apoplexy, and low fever, the latter being characterized by a slight fever of uncertain duration and without specific symptoms, which is cured quickly by change of climate. Urban fever is a fever of about 3 weeks' duration which is very similar to mild typhoid, excepting that specific symptoms are absent. There is a nonmalarial remittent fever, usually seen in young adults; the malarial parasite is never found and quinin is without effect. There is little change in the size of the spleen, but the liver becomes enlarged; the disease lasts about 6 weeks. The daily remissions are often as great as 2.5° F., and it bears some resemblance to Malta fever. There is also another fever, consisting of a febrile course of 10 days to 2 weeks, which is followed by a period of apyrexia which lasts from 3 to 7 days, and after this there is again a 10 days' period of fever, followed by convalescence. Sometimes icterus, accompanied by fever, is met in epidemic form in India. Crombie considers kala-azar a combination of malignant malaria and ankylostomiasis.

C. A. Siegfried,³ in writing of nonecontagious fevers, mentions an epidemic of so-called **simple continued fever**, which affected in all about 250 of the 400 men on the naval vessel on which Siegfried was serving in 1895. The epidemic was attributed to the unhygienic condition of the vessel.

J. Snowman⁴ describes what he calls **acute febrile catarrh** associated with inflammation of the glands of the head and neck, and believes that it is a special disease. It comes on with chill, fever, pain in the back, rapid pulse, and free sweating. There is at first severe headache, which after about 24 hours disappears; but the scalp remains extremely tender over certain areas, and at these points are found inflamed glands. These are situated particularly over the frontal, occipital, and postcervical regions. It is usually associated with acute tonsillitis, but yields readily to treatment.

W. F. Robinson⁵ describes a peculiar mild disease which appeared frequently in the troops at Honolulu. The chief symptoms were pains in the bones, headache, coated tongue, loss of appetite, and slight fever. The disease had no distinct resemblance to malaria. The chief symp-

¹ Brit. Med. Jour., Nov. 5, 1898.

² Ibid., Sept. 24, 1898.

³ Phila. Med. Jour., Jan. 21, 1899.

⁴ Brit. Med. Jour., Dec. 10, 1898.

⁵ Albany Med. Ann., Nov., 1898.

toms were the mental depression and loss of spirits. It has the nickname of "**boo-hoo**" fever. It is said to occur very frequently in strangers in the island. It yields readily to the use of quinin or phenacetin.

TUBERCULOSIS.

Etiology.—A. R. V. Weismayr¹ has made further investigation of the danger of **infection** with tuberculosis **from moist particles** expelled in coughing, etc. After placing nonpathogenic microorganisms in the mouths of patients, he found that plates held before the patients when they coughed showed bacilli on their surface, even when they had been held as far as 4 meters from the individual; and if the air of the room was set in motion the germs were sometimes found as far as 1 meter behind the patient. Coughing expelled the germs much farther than singing, crying, or loud talking. He found that the sputum in dropping from a height, as in expectorating into a cuspidor on the floor, scattered **bacteria** in considerable numbers; but when the receptacle was held near the mouth this did not occur. When plates were exposed before the mouth and the patient simply respired normally no microorganisms were found. After an hour had passed, it was found that any germs that had been floating in the air had settled to the floor. It was found also that microorganisms were expelled in coughing in nearly as large numbers, relatively, from the larynx as from the mouth; this is also probably true of the trachea. Even when tubercle-bacilli were present in large numbers in the sputum, there were few in the saliva. He decides that the teeth and mouth of tuberculous patients should be carefully cleansed and disinfected frequently, and that the sputum should be expectorated into receptacles placed on the wall, at a level with the chest, or, preferably, into pocket-cuspidors.

J. J. Curry² also has carried on some further experiments concerning the question of the **dissemination of tubercle-bacilli** by means of moist sputum. He investigated the mouth-fluid of 12 tuberculous patients. All of these individuals had tubercle-bacilli in their sputum, and 9 of them showed them at some time in the fluid of their mouths. In half of the cases, plates held before their mouths showed negative results; in the other half the results were positive. Those that were negative were all in patients whose cough was not violent and who kept the lips closed while coughing. The contrary was the case in the 6 positive cases. Curry believes that only a small part of the fluid driven out while coughing contains bacilli, and that these drops readily become dried, and that their **chief action** is by being mixed with dust and floating about **in dry form**.

E. Klebs³ investigated the same question, having patients with tuberculosis **cough** while glass plates were held within a few inches of their mouths. Upon examination of the plates bacilli were found in some instances, particularly in certain small, almost invisible spots which were covered with a thin layer of albuminous material. These spots contained air-bubbles, and therefore seemed unquestionably to come from the respiratory tract. He considers this further proof of the danger of having

¹ Wien. klin. Woch., Nov. 17, 1898. ² Boston M. and S. Jour., Oct. 13, 1898.

³ Chicago Med. Recorder, Sept., 1898.

phthical cases come in contact with others; and it is recommended that patients should be required to hold a cloth or paper to their mouths when coughing, and that this should be burned afterward. Klebs states that bacilli placed upon sterilized cotton and then enclosed in a stoppered tube and carried from Germany to the United States were dead when he reached here. This shows, he believes, that they cannot withstand protracted drying. [Unfortunately the last point is not confirmed by the studies of others, and does not accord with the conclusions deduced from clinical observations.]

Achard¹ reports a striking **series of contagions**. A man's wife died of tuberculosis; he remarried, and soon had evidence of tuberculosis himself; the second wife became tuberculous, and her first child died of tuberculous meningitis, while another child, nursed at the breast, died of mesenteric tuberculosis. The mother of these children lived but a short time.

Dubosquet-Laborberie,² in a study of **contagion in tuberculosis**, reports a series of 175 cases, in 107 of which he believed that he had established evidence of contagion from members of the family or of the household.

G. Dock and T. L. Chadbourne³ report a study of **tuberculosis in country people**, based upon an analysis of 119 cases, chiefly investigating 100 cases of chronic tuberculosis of the lungs. They especially insist that a careful study of the cases showed an absence of history of tuberculosis in the parents in 74 instances, and this is strong evidence of the frequency of contagion in this disease even in country people.

G. Hinsdale,⁴ in a study of the **distribution of tuberculosis in New Jersey**, found that the local mortality from this disease is in direct relation to the denseness of population.

S. Chandler⁵ reports a case which he believed was typhoid fever complicated with malaria, and subsequently terminating in **acute miliary tuberculosis**. The child was nursed by a consumptive mother, and Chandler thinks that infection took place from her during the early course of the disease. [The suggestion, while pertinent in analogous cases, is not supported by sufficient proof of the existence of either typhoid fever or malaria, and it is probable that the case was tuberculous from the beginning.]

Josset⁶ would explain the **infrequency of tuberculosis in miners** by the fact that there is little possibility for contagion, since the air in the mines is frequently renewed, and there are many vapors in the depths of the mines that are somewhat antiseptic. Thus, contagion becomes almost impossible. [The fibroid changes that occur in the lungs from the irritation of dust-particles must not be ignored in seeking for causes of reduced vulnerability to tuberculosis.]

D. N. Nason⁷ reports as instances of **direct contagion of phthisis** 4 cases of pulmonary tuberculosis which occurred in a class of 24 or

¹ Congrès pour l'Étude de la Tuberculose, 1898; Gaz. hebdom. de Méd. et de Chir., Aug. 25 and Sept. 1, 1898.

² Ibid.

³ Phila. Med. Jour., Nov. 5, 1898.

⁴ Va. Med. Semi-monthly, Nov. 11, 1898.

⁵ Congrès pour l'Étude de la Tuberculose, 1898.

⁶ Birmingham Med. Rev., June, 1899.

⁷ Ibid., Oct. 22, 1898.

25 girls, who attended a small school held in a room which was very close to the shop of a butcher who had been repeatedly convicted of selling diseased meat. The first cases were believed to have arisen originally through **infection from the meat**, and subsequently cases occurred from infection from the first. [It is difficult to accept without much reserve the author's view of the origin of these cases.]

A. T. Wise¹ describes 10 cases as illustrative of his emphatic belief that tuberculosis is frequently **disseminated through song-birds**, which are very subject to tuberculosis.

L. Guinard² drew attention to the danger of **transmission** of tuberculosis **from human beings to cattle**, particularly through infection of their drinking-water by discharges from tuberculous subjects. He had injected the sediment of water so infected into animals and produced tuberculosis.

W. H. Sheldon³ notes that there is no general unity of opinion concerning the frequency of **tuberculosis in dogs** and their susceptibility to the disease. He reports a case in a dog 8 years of age that had been sick for 2 years. It showed emaciation, had frequent attacks of ascites, and profound languor. At the autopsy there was found marked thickening of the pericardium, and the epicardium was covered with gray and yellow nodules. The lungs were normal, but the peribronchial glands were enlarged. There was adhesive peritonitis, and the liver showed a few grayish nodules on the surface, as did the spleen, and a few were found in the kidneys. Microscopic examination showed that the nodules were tuberculous and contained tubercle-bacilli in large numbers. From a review of other cases, Sheldon decides that tuberculosis is not so rare in dogs as it is commonly thought to be, and that these animals are especially prone to infection because they are likely to lick up the sputum of tuberculous patients. The lesions found resemble those seen in the subacute and chronic forms of the disease in man, though caseation is not likely to occur and giant-cells are usually absent. He insists that dogs that show clinical symptoms of tuberculosis should be killed to prevent spread of the disease.

Dubosquet-Laborberie⁴ describes the case of a man with tuberculosis who had 2 pet dogs, both of which apparently died of tuberculosis, and in 1 this diagnosis was confirmed by autopsy. The second dog, a terrier, was almost constantly with a pet cat; the latter also died of tuberculosis. This is an evidence of the **danger** of tuberculosis arising in children through contagion **from pet animals**. Nocard described a case in which a cow evidently acquired tuberculosis from a man. The animal had previously given a negative reaction to the tuberculin-test. For some time, however, she was cared for by a man with chronic bronchitis, which subsequently proved to be tubercular; about 5 months after this the cow began to cough, and gave a positive reaction to tuberculin.

H. M. Reynolds⁵ records the results of his study of **bovine tuberculosis** at the University of Minnesota Agricultural Experiment Station. He has data of over 3500 cattle tested with tuberculin, and of the

¹ Lancet, May 20, 1899.

² Congrès pour l'Étude de la Tuberculose, 1898.

³ Medicine, Feb., 1899.

⁴ Congrès pour l'Étude de la Tuberculose, 1898.

⁵ Northwestern Lancet, Oct. 1, 1898.

whole number 11 % were tuberculous, though this is not considered to be the true proportion that would be found in testing all animals, since those observed were chiefly from breeding-herds and city dairies, and such cattle are more prone to the disease. Of 71 postmortems upon animals that had reacted to the tuberculin-test, 70 showed tuberculosis. In the 1 other, tuberculous foci were not found, but it is possible that small areas may have been overlooked. He does not consider this test in cattle infallible, but thinks it almost so in cases of recent infection and where the lesions are limited. He believes that cattle supplying milk for cities should always be tested, and that licenses should be required, and should not be given unless tests are carried out, and repeated at least once a year. He insists that specially trained inspectors should replace the ignorant ones now often employed.

Bang¹ has studied the occurrence of **tuberculosis in cattle** in the various civilized countries of the world. He finds that in certain localities the results of tuberculin-tests were positive in as high as 80 % of the cattle tested. In Copenhagen the results have been from 25 % to 29 % of positive reactions; in Sweden there were about 42 %; while in Norway the native cattle gave only about 6 % of positive reactions. The positive reaction is always present in larger percentages in cattle coming from populous districts. He prevailed upon the Danish government to establish certain regulations regarding cattle; these are described.

A. A. Kanthack and E. S. S. Sladen² investigated 16 dairies supplying milk publicly, and found that in 9 instances the milk produced tuberculosis in guineapigs. Of 23 pigs that died from inoculations carried out, 13 had been inoculated with the creamy layer and 10 with the sediment obtained by centrifugation. This is striking evidence of the danger of **infection with tuberculosis through milk**. Even in the 7 instances in which the milk did not cause tuberculosis, the authors insist that 1 negative result is not sufficient evidence that such dairies are free from tuberculosis, as the bacilli might be absent at one time or from one specimen of milk and present in others.

Lydia Rabinowitsch and W. Kempner³ investigated the question of the presence of **tubercle-bacilli in the milk** of cattle that had beginning tuberculosis, without any recognizable disease of the udder, as well as in those that showed a tuberculin-reaction, but no other evidence of the disease. Of 15 cattle examined, 10 showed bacilli in the milk: 2 of these had no evidence of tuberculosis excepting the tuberculin-reaction; 1 had extremely slight disease; 3 had general tuberculosis, but no disease of the udder; 1 had, upon histologic examination, disease of the udder; while in 1 instance the disease of the udder was evident clinically. They decide that the milk of all animals that react to tuberculin should be considered dangerous.

Lydia Rabinowitsch⁴ has investigated 50 samples of **butter** obtained in the markets of Philadelphia. In none of these did she find tubercle-bacilli. There were, however, in many of them bacteria which were very similar to the tubercle-bacillus. [The nature of these bacilli remains in doubt. The possibility of their being tubercle-bacilli must be considered.]

¹ Congrès pour l'Étude de la Tuberculose, 1898.

³ Deutsch. med. Woch., May 25, 1899.

² Lancet, Jan. 14, 1899.

⁴ Ibid., Jan. 5, 1899.

Obermüller,¹ in testing 10 samples of market-butter obtained from various sources, found unquestionable tubercle-bacilli.

V. Scheidner² has examined **tonsils** recently removed by operation from 29 cases, without choosing his cases, and found in 2 the histologic appearance of tuberculosis, but in none was there bacilli. In 1 case there was what seemed to be healed tuberculosis. The cases discovered were probably primary aspiration-tuberculosis. The tonsils were also removed from cases that had died with tuberculosis; in all, from 32. Among these were 2 that showed evidences of primary tuberculosis, in 1 of which the infection was probably through the food. He intends to continue his studies in some resort for tuberculous subjects to see the effect of herding such individuals together.

G. Hauser³ gives an elaborate review of all the previous work that has been done upon the **inheritance of tuberculosis**; and after discarding a great deal of this as entirely unreliable or irrelevant, reaches the conclusion that there are but 18 certain instances of direct inheritance of tuberculosis. In 9 of these only was the tuberculosis advanced; in 5 the bacilli were found in the fetal organs, and in 4 in the fetal placenta. In all these cases the mother only had tuberculosis. Hauser has been able to find no case of satisfactory evidence of transmission from the father; and even in advanced cases of general miliary tuberculosis in the mother few children are born tuberculous. Hauser has made some experiments in guineapigs and rabbits in the endeavor to produce experimental hereditary tuberculosis, infecting some of the animals before conception and some of them afterward. In 30 instances he thought that a hereditary infection might be reasonably expected—in 12 instances in rabbits and 18 in guineapigs. All of the 12 rabbits had affected parents on both sides, while 14 of the guineapigs had infected fathers and 4 infected mothers; 8 of the young died during the first 7 weeks of life, and none showed tuberculosis; the remaining 22 were kept alive for from 4 to 22 months. One accidentally killed had general tuberculosis, but none of the others showed the disease. Hauser decides that the theory of the bacillary inheritance of tuberculosis has not sufficient foundation, and is not readily reconciled with many facts which have been observed. He thinks that there is an hereditary predisposition in many animals to tuberculosis, but that the development of the disease is due to an infection with bacilli from outside, and not to direct transmission from the parents.

H. M. King,⁴ from a study of 100 carefully tabulated cases of phthisis, was unable to discover that **hereditary influence** was more marked in these individuals than in a series of nontuberculous persons whose heredity was investigated. In the first group 28 individuals had had tuberculous parents; in the second series 26 had a similar tuberculous history. In 28 cases a history of infection could be definitely established. In 90 instances either the pleura or pericardium, or both, showed involvement. There were but 2 cases of genitourinary tuberculosis in his series. Pyothorax in all instances was, he believes, due to infection with pus-cocci, since these were always found in the exudate. [This does not, however, exclude the presence of tubercle-bacilli in the exudate, since their discovery is much more difficult.] He reports 1 case of unusual duration in

¹ Hyg. Rundschau, No. 2, 1899.

² Deutsch. med. Woch., May 25, 1899.

³ Deutsch. Arch. f. klin. Med., Band lxi., Hefte 5 u. 6.

⁴ Med. News, Dec. 3, 1898.

a man now 50 years of age, who has had phthisis for 30 years, tubercle-bacilli being known to have been present in his sputum for many years, and still persisting; his health, however, remains practically normal, though there are physical signs at one apex.

E. O. Otis,¹ in a valuable discussion of the causes of pulmonary tuberculosis, considers the methods of preventing the disease, with the means of disinfecting rooms, railway and street cars, and places of public assemblage. He does not believe that the actual tendency to the disease is inherited, but merely that a poor vitality exists from birth, and that the same conditions in individuals who have no tuberculous family history are quite as dangerous as in those who have. He found that only 5.9% of 27 young men examined had lost either parent from tuberculosis; and believes that all those of **poor muscular development** and **deficient respiratory capacity** are in danger of acquiring the disease. He gives well-considered methods of avoiding an existing predisposition and the danger of infection. [The reduced vitality and poor physical constitution to which the author refers are, however, certainly more common in affected families, and constitutes the inheritance.]

Arloing and Nicolas² investigated the effects of a **previous infection with streptococcus** upon experimental tuberculosis in the rabbit. They find that it always favored the development and wide extension of the lesions.

Lannelongue and Achard,³ in an experimental investigation of the **role of trauma** in the production of tuberculosis, infected guineapigs, and then produced various injuries. The animals died of general tuberculosis; but in no case did the authors observe any local tuberculosis that seemed to be the result of the trauma.

J. Anclair⁴ concludes from his experimental work that tuberculous pneumonia is produced by the poison derived from the tubercle-bacillus that is extracted in ether, and which he therefore calls **etherobacillin**. Tracheal injection of this substance in animals produced consolidation of the lung.

M. Hiervieux⁵ notes the importance of smallpox in the production of **increased disposition** to tuberculosis, and insists that this renders vaccination more obligatory in those countries which send soldiers, who are especially subject to tuberculosis, to regions where smallpox is likely to be epidemic. The same subject is discussed by P. A. Lop,⁶ who describes 64 cases observed by himself in which this connection could be traced. The tuberculosis developed late in many of the cases, and this he considers is usually the case, several years often passing after the attack of variola before the person becomes tuberculous. He insists strongly upon the necessity for obligatory vaccination.

G. Carrière⁷ records the case of a man of 23, who had in 1894 what was diagnosed **Woillez's disease**. He subsequently developed tuberculosis in the right base, the same region that was previously affected; and Carrière believes that the pulmonary congestion induced the tuberculosis. [It is

¹ Am. Jour. Med. Sci., Nov., 1898. ² Congrès pour l'Étude de la Tuberculose, 1898.

³ Compt. rend. de la Acad. des Sci., Paris, May 1, 1899.

⁴ Gaz. hebdom. de Méd. et de Chir., July 24, 1898.

⁵ Bull. de l'Acad. de Méd., Apr. 18, 1899. ⁶ Rev. de la Tuberculose, Apr., 1899.

⁷ Gaz. hebdom. de Méd. et de Chir., Mar. 25, 1899.

not improbable that various infections may begin in the form of "Woillez's disease," which, after all, has not been proved to be a distinct entity.]

Symptomatology.—L. Beco¹ examined 20 cases of advanced ulcerative tuberculosis of the lungs in order to determine whether there is usually a **general infection** of the organism by the tubercle-bacillus or other bacteria. In none did he find the tubercle-bacillus; while in 2 he found the streptococcus in the spleen, and in 2 others the colon-bacillus in the same situation. These were probably, however, post-mortem infections. The blood was always sterile.

C. Maisonneuve² discusses **dilatation of the right heart** in pulmonary tuberculosis. Unassociated with tricuspid insufficiency this occurs frequently, and has little effect upon the course of the disease. It is due to increased pressure in the pulmonary artery and to fatty degeneration of the heart-muscle. Associated with insufficiency of the tricuspid, the condition is comparatively rare, and is due to the advance of the distention to the auriculoventricular orifice. When this stage occurs the prognosis is extremely bad. [It has often been observed by writers that disease of the right heart is less frequent than might be expected in phthisis. This is due to the rarity of severe changes in the muscle of the heart.]

R. Grandin³ discusses the **changes in the heart** in tuberculosis, and divides them into 2 groups, the first being the result of intoxication with tuberculin, and the second being due to compression of the nerves by enlarged bronchial glands or to circulatory stagnation from the same cause. In the second group there are often no definite **myocardial lesions**. The respiration is usually increased in physiologic ratio to the pulse; but this is not always true. The arterial pressure varies, being sometimes increased, sometimes decreased.

W. Croner⁴ divides the **gastric disorders** which occur in the early stages of pulmonary tuberculosis into 2 forms. In one the evidences of disease of the lungs are sometimes entirely or almost completely absent, the gastric distress being the only complaint. In the other form there is distinct tuberculosis. Chemical examinations of the gastric secretions do not give the same results with different observers. Croner has found the acidity usually normal, subacidity occurring quite frequently, but absence of HCl occurred in only 5 of the 36 cases he examined. The motor power of the stomach was not diminished in any case, and he found no relation between the fever and the amount of acid present. The discovery of an acidity by numerous observers is, in his belief, due to the admixture of mucus, etc., from the swallowed sputum. He decides that the disturbance of the stomach is usually functional, since the symptoms and signs are inconstant and the gastric secretions show various conditions. He therefore thinks that patients may safely be given abundant food without special consideration of the stomach. He does not think that overfeeding has much to do with the gastric symptoms observed in most cases of phthisis.

J. H. McGee⁵ describes a case of advanced phthisis, the physical examination of which, as well as radiographs, showed the presence of **dislocation of the heart** to the right, resulting from contraction of the

¹ Rev. de Méd., May, 1899.

² Thèse de Paris, 1898.

³ Ibid., 1889.

⁴ Deutsch. med. Woch., Dec. I, 1898.

⁵ Intercol. Med. Jour. Austral., Nov. 20, 1898.

right lung. The patient was entirely free from symptoms referable to the heart.

W. Hale White¹ describes the case of a man with phthisis of the right lung. The existence of what proved postmortem to be a large cavity involving the whole upper lobe of the right lung, together with consolidation of the lower lobes, caused **peculiar transmission of the heart-sounds**, so that they seemed louder on the right than on the left, and there was an impulse in the fifth right intercostal space. The diagnosis during life had been : contraction of the fibroid lung drawing the heart to the right. At the autopsy the heart was found in normal position, however, and the transmission of the sounds seemed to be due to the cavity acting as a resonator. There was no obvious explanation for the impulse on the right.

W. S. Wilmore² describes a similar case of phthisis with cavities in the apex of the right lung, in which the cardiac impulse and dulness were absent on the left and the sounds were faint ; while on the right, in the fifth interspace, there were a weak pulse and an apparent area of cardiac dulness. The sounds were clearly heard on this side. Postmortem, the heart was found in normal position, however ; while the signs on the right were due to consolidation of the lung and probably to **increased transmission of the heart-sounds** through the large cavities.

W. Ewart,³ in discussing the cases reported by Hale White and Wilmore, describes a similar case of his own, in which he believed that the physical signs of dextrocardia were due to the heart being actually on the right side, and that the postmortem finding of the heart on the left side was the result of the opening of the chest-cavity, which allowed it to fall back to the left side. He thinks that such hearts are held on the right side by the atmospheric pressure. The use of the x-rays would determine the question.

G. Gabrilowitsch,⁴ in studying 380 cases of phthisis, found that 213 had **hemoptysis**. He treats this complication by injections of ergotin and morphin, and after the hemorrhage has ceased gives hydrastis for several weeks. He found that hemorrhages occurred most frequently in March and October ; while in his series practically none appeared during the summer months. [Attention has, of late, been called by a number of authors to the probable inefficacy and, possibly, even harmfulness of ergot in hemoptysis.]

R. L. Bowles⁵ describes several cases in which sudden unconsciousness with lividity resulted from a flooding of the lungs with blood in hemoptysis. One of these cases died almost immediately from suffocation.

Gilbert and Weil⁶ describe a case of pulmonary tuberculosis complicated by **hemoptysis, epistaxis, and melena**. The *Staphylococcus albus* was found in the blood. Coagulation took place only after an hour in the blood that was lost, but the coagulation-time was normal within 3 days after the use of extract of liver.

H. Ruhl and Hierokles⁷ record the occurrence of **thrombosis** in 19 of 1778 cases of tuberculosis of the lungs. Of these cases, 13 were

¹ Lancet, Nov. 19, 1898.

² Ibid., Dec. 10, 1898.

³ Ibid., Feb. 11, 1899.

⁴ Berlin. klin. Woch., Jan. 2, 1899.

⁵ Brit. Med. Jour., July 23, 1898.

⁶ Compt. rend. de la Soc. de Biol., Nov. 5, 1898.

⁷ Berlin. klin. Woch., Jan. 23, 1899.

between 20 and 40 years of age; 7 were men and 12 women. In every instance the disease of the lungs was advanced. The veins of the lower extremities were most frequently affected.

B. Fränkel¹ reports a case of tuberculosis of the larynx in which **tracheotomy** was undertaken because of grave dyspnea. The wound subsequently became infected with tuberculosis, and did not heal. He has seen 1 other similar case.

Raviart and Marlier² report the case of a man of 22 who had extensive tuberculous lesions of the tongue and larynx, consecutive to pulmonary tuberculosis. He suddenly became partly asphyxiated after an attack of coughing, this being followed by great swelling of the face and neck from **subcutaneous emphysema**. The symptoms subsided after a few hours, but the pulmonary tuberculosis caused death, and the autopsy showed that there had been a perforation of the larynx at the angle formed by the vocal cords anteriorly, an unusual situation for such an occurrence.

Diagnosis—Serum-reaction.—Arloing³ has demonstrated that the serum of animals, which had been inoculated with cultures of tubercle-bacilli or with tuberculin, agglutinated the tubercle-bacillus. He has also investigated this question in human beings, and has found that in cases certainly or probably tuberculous, **agglutination occurred** in 94%; while in those that were probably free from tuberculosis, he obtained agglutination in but 32%.

S. Arloing and P. Courmont⁴ state that certain **precautions** are **necessary** in order to obtain satisfactory agglutination with the serum of tuberculous patients. The upper portion of the culture should be used, and clear serum should be obtained by centrifugation when possible. The tubes used for the gross method should be of small diameter and inclined at an angle of 45°; dilutions of 1 to 5, 1 to 10, and 1 to 20 should be tried. Any higher strength than 1 to 5 signifies nothing, while the reaction with a greater dilution than 1 to 20 is uncommon even in tuberculous cases. The time for complete reaction varies. A specimen should be examined at periods varying from 2 to 24 hours; after this time any agglutination is valueless. The gross and microscopic methods may be used together. The reaction is positive if there is complete clarification with deposition of granules at the bottom of the tube. Of 26 cases of advanced tuberculosis of the lungs, 24 reacted; the 2 that did not react were undoubtedly tuberculous; 22 cases of comparatively early phthisis gave 95.5% of reactions. Twelve cases of surgical tuberculosis gave 50% of marked reaction and 50% of feeble reaction; 21 cases of diverse illnesses gave 14 negative results and 7 feeble positive reactions. Of 13 typhoid cases investigated there were 6 negative reactions, and 2 at least of the positive cases were suspected of tuberculosis; 16 healthy subjects, between 16 and 30 years of age, gave 5 positive reactions. [Leaving out of consideration the ultimate proof or disproof of the principle involved in the test, it is apparent that there are gross mechanical reasons for great unreliability as compared with the typhoid test. The agglutination or granular precipitation of nonmotile organisms must be liable to favorable or unfavorable influences of purely mechanical

¹ Berlin. klin. Woch., Apr. 10, 1899.

² Echo méd. du Nord., April 16, 1899.

³ Gaz. des Hôpitaux, June 9, 1898.

⁴ Rev. de la Tuberculose, Oct., 1898.

kinds much oftener than that of motile organisms like the typhoid bacillus.]

Mongour and Duard¹ obtained a positive **agglutination-reaction** in 5 cases of pleurisy and 9 of pulmonary tuberculosis. In 20 other cases that were being treated for other diseases a latent tuberculosis was shown by the reaction.

P. Courmont² has investigated the **serum-diagnosis of effusions** thought to be tuberculous, and thinks that this provides a rapid and satisfactory method for diagnosis in most of these cases. Of 11 pleurisies which were clinically tuberculous, 10 gave positive reactions. The negative case remained of doubtful character, since inoculation of a guineapig did not cause tuberculosis. Of 9 pleurisies clinically not tuberculous, 4 gave a positive reaction, while 5 were negative. In 2 of the latter 5 cases autopsy showed that the disease was not tuberculous. In 12 cases of ascites, 5 clinically tuberculous gave the reaction; while 7 that seemed clinically to be due to hepatic cirrhosis gave no reaction.

Dubard,³ in investigating the reaction of agglutination of the tubercle-bacillus in the presence of blood-serum from various animals, found that the **reaction was marked in proportion to the immunity** possessed by the individual. The order of intensity, beginning with the most marked, was: the horse, the cat, the sheep, man, the monkey, and guineapigs. The blood-serum of 2 gouty men had marked agglutinating power; the injection of antiseptics increased the agglutination. He decides that reaction should not be considered positive unless there is agglutination and precipitation within 24 hours, and in a dilution of at least 1:5.

M. Beck⁴ considers **Koch's tuberculin** extremely valuable in the diagnosis of incipient tuberculosis, and does not believe that it has any injurious action when properly used; he takes the temperature of the case for a day or two beforehand, in order to determine the conditions usually present in an individual. He then administers 1 mg. of tuberculin; if the reaction is not produced, this is increased in a day or two to 5 mg. and subsequently to 10 mg. He recognizes a reaction only when there is an elevation of at least 0.5° C. The injection should not be undertaken when patients have marked or irregular fever. He has carried out 2508 injections, 295 of them in patients certainly tuberculous. Of the remaining 2213, suspicious signs existed in 338, and 298 of these gave positive reaction. Of 25 cases of laryngeal ulcer of doubtful nature, 17 reacted; and the reaction was obtained in 67 of 106 cases that had been diagnosed influenza. Among 68 cases of phthisis 50 reactions occurred; 12 of 13 cases of adenoid growths of the nasopharynx gave reaction, and altogether 1525 of the 2508 cases tested gave reaction; and he believes that the diagnosis of tuberculosis could not have been made otherwise in 1154 of the cases. I. H. Neff⁵ thinks it important that the temperature be taken for at least 48 hours, at 2-hour intervals, before a tuberculin-test is carried out, thus excluding the frequent sudden rises in temperature from other causes. He reports 20 cases injected for diagnostic purposes; 7 reacted, and all were subsequently proved tuberculous; 5 undoubtedly tubercu-

¹ Compt. rend. de la Soc. de Biol., Dec. 10, 1898.

² Congrès pour l'Étude de la Tuberculose, 1898.

⁴ Deutsch. med. Woch., Feb. 23, 1899.

³ Ibid.

⁵ Am. Jour. Insanity, Jan., 1899.

lous gave no distinct reaction, the reaction being rendered obscure by oscillations of temperature.

McCall Anderson¹ believes that the **new tuberculin** is safer than the old, and advises its use in diagnosis, particularly for the purpose of discovering foci of the disease that are not evident upon ordinary physical examination. As an example of its value, he states that in a case of lupus, injection of tuberculin caused the appearance of an inflammation in the right elbow-joint, which had been previously unsuspected; and also in a case of tuberculosis of the lungs, apparently limited to one apex, tuberculin-injection caused the appearance of moist râles in the other apex. He describes 4 cases treated with the new tuberculin; but while he expresses his own satisfaction with the treatment, it is difficult to see any satisfactory results in his report, and the method of diagnosis is certainly somewhat violent.

E. O. Otis² has used the **tuberculin-test** in the **diagnosis of cervical adenitis**. The original tuberculin was used in a dose of from 1 to 5 mg. in a series of cases, without making any distinction between those due apparently to some local cause, as a decayed tooth, or those without any definite cause. The reaction could not be carefully studied in all cases, since they were dispensary patients; but if there were sensations of weakness, flashes of heat and cold, and general malaise, with pain in the limbs and head, and loss of appetite—these symptoms having a well-defined beginning and coming on a few hours after injection—the patient was considered to have shown reaction. Of 29 cases injected, 18 gave positive reaction and 2 were doubtful. Of the 11 cases that did not react, 6 had shown glandular enlargement for less than 3 weeks. The author advises local surgical treatment, if possible, in all cases giving positive reaction.

Péron³ makes the interesting report that the fluid removed from the pleura of cases of tuberculous pleurisy protects animals wholly or partially from experimental tuberculous. This he considers of clinical importance, since it may explain the fact that in certain cases injection of animals with the apparently tuberculous fluid from the pleura does not cause tuberculous.

M. Dorset⁴ has had good results from the **staining of tubercle-bacilli** with a saturated solution of **sudan-III** in 80% alcohol. This is used for 5 minutes. The excess is subsequently washed off by using repeated changes of 70% alcohol. This stain is said to be selective for tubercle-bacilli, these being found red; other bacteria, even smegma-bacilli, do not take the stain. The tubercle-bacilli show the beading commonly seen very strikingly with this stain, and it is believed that **sudan-III** has an especial affinity for this bacillus, because these beads are fat-droplets contained within the body of the bacillus.

A. Pappenheim⁵ describes a case that occurred in a woman of 35, who first showed only severe emaciation, without any definite physical signs, and was treated for tapeworm. Several specimens of *Bothriocephalus latus* were passed, but her health did not improve. Cough developed; the sputum contained bacilli which were believed to be tu-

¹ Brit. Med. Jour., Oct. 1, 1898.

² Med. News, July 9, 1898.

³ Compt. rend. de la Soc. de Biol., Oct. 22, 1898.

⁴ N. Y. Med. Jour., Feb. 4, 1899.

⁵ Berlin. klin. Woch., Sept. 12, 1898.

bercle-bacilli, and death finally resulted. At the autopsy tuberculosis was found to be absent, and yet there were large masses of bacilli; but these could not be cultivated, and sections made from the tissues contained no bacilli that gave the characteristic stain. Since those discovered were decolorized rapidly by alcohol, Pappenheim decides that they were **smegma-bacilli**. Attention is directed to the fact that such a case makes it evident that grave errors in diagnosis might be made, owing to the discovery of the smegma-bacilli in other places than about the genitals. Pappenheim has endeavored to provide a satisfactory **distinguishing stain**, and after considerable work decides that the best method of distinguishing between the tubercle-bacillus and the smegma-bacillus is by staining with carbol-fuchsin, then again staining in a solution which consists of 100 parts of absolute alcohol, 1 part of rosolic acid, and methylene-blue to saturation, to this 20 parts of glycerin being finally added. This solution is applied to the cover-glass, and it is then slowly allowed to run off; this is repeated from 3 to 5 times. Tubercle-bacilli will then be found stained a brilliant red, while the other bacteria, including smegma-bacilli, will be found colored blue. A. Fränkel¹ has found smegma-bacilli in the sputum of a number of cases of gangrene of the lung; but he has never found them in ordinary mucopurulent sputum, and does not consider the differentiation between these bacilli and tubercle-bacilli a matter of importance. It is only when the sputum is putrid that he believes differentiation should be undertaken. It should then be carried out by using Honsell's method, immersing the substance, stained with carbol-fuchsin, in absolute alcohol acidulated with HCl, and subsequently staining with a solution of methylene-blue. Smegma-bacilli are decolorized after 10 minutes' action of the acid alcohol, while tubercle-bacilli are not.

G. W. Johnson,² in a study of the blood of 50 patients with advanced tuberculosis, found **leukocytosis** in 45. He considers an increase in the leukocytes in this disease practically diagnostic of the existence of cavities. A disproportionate **reduction of the hemoglobin** was found in 8 cases, the blood-picture resembling chlorosis. [Other complicating conditions must be remembered in connection with the occurrence of leukocytosis, though it is, of course, most frequently due to cavity-formation.]

H. Walsham³ presents a skiagraph which shows that pulmonary cavities thought, from the results of physical examination, to be quite large were really small. He states that he has found the **x-rays** valuable in discovering tuberculous lesions at the apices, in diagnosing pleural effusions, and as an aid in the diagnosis of consolidation of the lung or pleural adhesion, owing to the changes in the mobility of the normal shadows and light areas. He does not think that there is any difference to be seen in the shadow of a pleural effusion and that from consolidation of the lower lobe. He also believes that the x-rays will not prove of much value in the examination of the heart, since other methods are at least quite as useful and much less troublesome.

H. P. Loomis,⁴ in discussing the **diagnosis of the pretuberculous state**, especially insists upon the value of **chloranemia**, particu-

¹ Berlin. klin. Woch., Oct. 3, 1898.

² Jour. Am. Med. Assoc., Dec. 25, 1898.

³ Lancet, Oct. 15, 1898.

⁴ Med. Rec., Dec. 10, 1898.

larly when this is associated with poor development of the chest and imperfect respiratory capacity. It is especially important to note the relation between the weight, the chest-development, and the respiratory capacity in connection with the height of the individual. The normal product of the division of the weight in pounds by the height in feet should be in man 26, in woman 23; while the chest-measurement should equal at least half the height. As to the respiratory capacity, the amount expressed in cubic inches of air expelled after full inspiration, should have a ratio to the height of a man of 3:1; in a woman of 2:1. The pulse of the pretuberculous patient is peculiar in showing little influence from change of positions, but is rapid and of low tension. [As far as the importance of chloranemia is concerned, we would add at least one word of caution—viz., that a moderate disproportion between the amount of hemoglobin and the number of red corpuscles does not constitute chloranemia.]

R. Oestreish,¹ basing his method of examination upon the fact that there is in early tuberculosis of the lungs always formation of fibrous tissue and contraction, has percussed the apices of a number of cadavers by **Krönig's method**. This consists in determining the inner, outer, and upper border of the apex, particularly posteriorly. He decides that when a lesion as large as a cherry or numerous smaller foci are present, this method will determine changes in the percussion-note. He states enthusiastically that he considers it better than the examination for tubercle-bacilli, since the latter are likely to be absent for a considerable time, while this sign appears very early.

E. F. Wells² recommends the use of **potassium iodid** in the **diagnosis** of tuberculosis of the lungs. The drug is said to increase the râles and make the seat of disease evident.

Murat³ describes as a **new symptom** of tuberculosis of the lungs a sensation noted by the patient of vibration of the affected part of the chest while talking aloud. It gives a sense of discomfort. It is due to transmission of the vibration through the infiltrated area.

Morano⁴ has studied the **position of the cardiac apex** in tuberculosis, led to this by Cardile's statement that it is usually displaced inward in this disease. He was unable to confirm Cardile's observations.

E. G. Janeway⁵ directs attention to the **danger of confusing** chronic **syphilitic fever** with tuberculosis, and reports 6 cases, in some of which such a mistake had been made. The first patient had lost weight rapidly, had grown weak, and had continued fever and pain in the right side. The latter was found to be due to perihepatitis. Antisyphilitic treatment caused entire recovery. In the second case there were fever, sweats, emaciation, and pain in the right side, without evidences of disease of the lungs. A sinus which led down toward the clavicle was found, and some of the ribs were tender. The institution of antisyphilitic treatment caused entire recovery. The third case had been previously diagnosed as tuberculosis, and the patient had been treated in a special resort, his health growing constantly worse. One case occurred in a child, which had fever, emaciation, and enlargement of the liver. At the autopsy the

¹ Zeit. f. klin. Med., Band 35, Hefte 5 u. 6. ² Jour. Am. Med. Assoc., Feb. 4, 1899.

³ Gaz. hebdom. de Méd. et de Chir., No. 19. ⁴ Riforma Med., Sept. 3, 1898.

⁵ Am. Jour. Med. Sci., Sept., 1898.

uncertainty between tuberculosis and syphilis was settled in favor of the latter.

Treatment and Prophylaxis.—T. W. Grimshaw¹ discusses the prevalence of **tuberculosis in Ireland**, and shows that from 1892 to 1896 a total of 476,381 deaths occurred in the United Kingdom from various forms of tuberculous disease, this being 10.8% of the population; while in Ireland the total percentage of deaths from tuberculosis averaged 13.9%, and the disease seemed to be increasing. There was a marked excess of cases among dwellers in cities, such districts showing a mortality from this disease of 25.4% of the total mortality. The deaths from phthisis between the ages of 15 and 45 constituted 43.5% of all deaths; between 15 and 25, it caused 53.8%. Grimshaw considers that **isolation in hospitals** is the only way in which this increasing mortality from tuberculosis can be controlled.

S. A. Knopf² contributes a paper upon the State and municipal care of consumptives. He believes that a commission should be provided for the examination and care of tuberculous subjects; to determine their physical condition; to investigate their surroundings and the dangers to their families; to render their homes sanitary, if possible, and, if necessary, to endeavor to remove the patients to an institution. Any one should have the privilege of being examined, and all physicians should have the privilege of recommending patients for examination. The institutions for the care of these individuals should comprise a reception hospital and dispensary, located in the city; a suburban sanatorium, in an elevated region, if possible, this to be used as a temporary hospital for patients subsequently to be sent to a mountain sanatorium, which should, if possible, be elevated from 1000 to 2000 feet above sea-level. There should also be seaside sanatoriums for the treatment of children with tuberculous disease of the joints and glands, and a maternity sanatorium.

Knopf³, in reply to the suggestion of the establishment in Southern California of a farm for tuberculous subjects, says that the removal of a patient far from home frequently has a bad result because of the depression that follows. It is also difficult to secure employment in California, and patients are for this reason likely to feel want. Further, the expense of reaching California is very great. Knopf believes that patients can be treated quite as well at home as in California or elsewhere, if they are properly managed.

R. W. Phillips⁴ does not believe that the usual conditions of temperature, dryness, and elevation commonly considered essential are necessary for the successful treatment of pulmonary tuberculosis. He describes the system which is used in the Victoria Hospital for consumptives in Edinburgh, and the good results which he obtained chiefly by free exposure of the patients to the open air.

Schjerning,⁵ in discussing the question of **tuberculosis in the German army**, notes its rarity as compared with other armies, and directs notice to the fact that the morbidity per thousand has declined from 0.42 in 1890 to 0.24 in 1897. Those who show the disease are chiefly soldiers whose homes are in densely populated regions, as large cities. The fact

¹ Dublin Jour. Med. Sci., Mar.-Apr., 1899.

² Med. Rec., Sept. 24, 1898.

³ N. Y. Med. Jour., Aug. 6, 1898.

⁴ Brit. Med. Jour., July 25, 1898.

⁵ Deutsch. med. Woch., May 25, 1899.

that many cases occurred among musicians who frequently played in dance-halls, or among those who were allowed to visit tuberculous relatives, makes it probable that many of the cases are acquired entirely outside of the actual army life and conditions.

B. Fränkel,¹ in view of the results of the work of Flügge and others, has caused his patients to **wear a mask** over the face day and night, allowing them to remove it only to expectorate or while at meals. In half of 52 masks which showed soiled areas he found tubercle-bacilli on the inner surface. Partly for the mental effect upon the patients, and thus to induce them to wear the masks, and partly for a possible therapeutic effect, he moistened the gauze covering of the mask with a preparation of some essential oil.

A great number of tuberculins, antitoxins, and similar preparations has been under observation; but thus far no very useful results have been reached.

S. Arloing, J. Courmont, and J. Nicolas² have made an extensive study of the effect of **tuberculin R**. They decide that it has no favorable effect upon experimental tuberculosis, but that it does not contain the substances found in the old tuberculin which caused high fever, paralysis of the vasomotors, and toxic cardiac symptoms. In the discussion of the paper similar views were expressed by others. Vaquier had had no good results from the use of TR in the treatment of 5 cases of pulmonary tuberculosis in children. Leclerc had seen no unfavorable results, but no good effects. Bonnhill had had only bad effects from its use, since it produced severe local reaction and the general condition became worse. Benoit, on the contrary, believed he had had some valuable results. Bandelier³ has treated 12 patients with tuberculin R, all these individuals being previously observed to determine that fever was absent. Small doses were used in the beginning, the amount being gradually increased. All but 1, a somewhat advanced case, showed improvement. He has also obtained good results in treating tuberculous disease of the bones and joints with TR. N. Raw and J. H. Abram⁴ have used tuberculin R in 13 cases of tuberculosis of the lungs. Four patients recovered entirely; but they were all favorable cases, and the results were therefore not better than those from other methods. Cases of lupus, however, showed marked improvement. In pulmonary cases serious reaction with grave collapse occurred at times. This was probably due to variations in the strength of the TR. G. G. S. Taylor⁵ reports 4 cases of lupus treated with tuberculin R. They first improved notably, then became stationary, and then the disease began once more to advance. All the patients complained of malaise, loss of appetite, pains in the back and limbs, and weakness of the legs. The local reactions were less marked than with the old product. There were no abscesses. G. A. Heron⁶ states that of the 5 cases of lupus which he reported as cured by injection of the old tuberculin, all have relapsed since his report in 1891; and of the cases of tuberculosis of the lungs which he then reported, 8 have since died, the same number remain fairly well, and the others have disappeared from observation. He has recently used tuberculin

¹ Berlin. klin. Woch., Jan. 8, 1899.

² Congrès pour l'Étude de la Tuberculose, 1898.

³ Deutsch. med. Woch., Dec. 22, 1898.

⁴ Lancet, July 23, 1898.

⁵ Brit. Med. Jour., July 8, 1898.

⁶ Ibid., July 8, 1898.

R in 10 cases; 9 of these were tuberculosis of the lungs, and all of them of a more severe degree than that recommended by Koch for this treatment. Two cases of far-advanced disease were fatal; the others improved, and some of them apparently recovered. There was no local ill-effect from the injections. The dose was at first $\frac{1}{500}$ mg., increasing $\frac{1}{100}$ mg. until $\frac{1}{10}$ mg. was given at a dose, then increasing $\frac{1}{10}$ mg. up to 1 mg., and then giving at each dose $\frac{1}{2}$ mg. more until 5 mg. was reached, and this was gradually increased to 20 mg. If the injection caused a rise of more than 5° F., the same dose was repeated until no rise of temperature occurred. In 1 case of lupus that was treated the patient seemed to recover entirely. P. F. Krause¹ has treated 41 cases of tuberculosis with tuberculin, and has most optimistic views regarding its powers, claiming cures in 12 early cases and improvement in the others. He prefers the old tuberculin to TR. [The results are entirely unreliable, owing to the fact that tubercle-bacilli were not found in some of the cases said to be cured, and in some they were not looked for.]

G. W. Aitkin² reports several cases of phthisis that improved upon the use of tuberculin, and states that 1 case here recorded is the only one in his experience that has not improved at some time during treatment. He considers tuberculin chiefly valuable as a **diagnostic agent**, however.

J. Denys³ reports that he has prepared a **new tuberculin**, and has used it successfully in dogs infected with tuberculosis. In 19 human subjects in advanced stages of tuberculosis the result was negative; in 16 febrile cases moderately advanced some improvement occurred; while of 48 apyretic cases, 15 were cured and 25 improved.

Arloing and Guinard⁴ decide that the effects of tuberculin are in part due to poisons developed in the bouillon culture-medium and in part to those derived from the bodies of the bacilli. The latter affect the temperature and the heart chiefly; while the bouillon-products affect the gastrointestinal tract, the vasomotors, and the heart.

E. L. Trudeau and E. R. Baldwin⁵ record a long and painstaking series of experiments, which they carried out at the Saranac Laboratory, on the preparation and effects of **antitoxins for tuberculosis**. The result of their 4 years' work was almost negative so far as practical outcome is concerned. No effect upon the bacilli or the course of the disease in guineapigs was seen from serum taken from sheep injected with killed thymus-cultures, nonvirulent cultures, or with tuberculin. Similar negative results were seen from the serum of chickens inoculated intraperitoneally with mammalian tuberculosis; from the serum of an ass inoculated intravenously with nonvirulent cultures; and from that of an ass inoculated with nonvirulent bacilli and afterward treated with several extracts of live and dead bacilli. An ass that was inoculated with virulent bacilli and then treated with tuberculin seemed to possess a possible antitoxic power in its serum. The same was true of the serum of rabbits inoculated with nonvirulent and virulent bacilli in which recovery occurred. They also studied several preparations made by others, and saw no effect from any of them, except one produced by inoculating a

¹ Deutsch. med. Woch., May 25, 1899.

² Denver Med. Times, Nov., 1898.

³ Congrès pour l'Étude de la Tuberculose, 1898.

⁴ Ibid.

⁵ Am. Jour. Med. Sci., Dec., 1898; Jan., 1899.

horse with nonvirulent cultures. This seemed to have some antitoxic power.

J. E. Stubbett¹ used **antitubercle-serum**, prepared by de Schweinitz by injecting tuberculin or liquid culture-mediums into 2 cows and a heifer, in treating 82 cases of tuberculosis of the lungs. In about 80% there was improvement in the expectoration, cough, appetite, weight, and general condition. The temperature was lessened in about half the cases. The tubercle-bacilli disappeared in about 13%, and became much diminished in 35%; 21% of the patients seemed to acquire immunity. In laryngeal cases he found that the disease was arrested in 46%; when ulceration was present the ulcers healed in 50%. Antistreptococcic serum was used in 6 cases in which there was mixed infection. The results in all these cases were encouraging. In 2 cases the streptococci disappeared entirely as long as the cases could be followed. In other cases they disappeared for some months, and the symptoms were distinctly improved.

W. F. Chappell,² in describing the results obtained at the Loomis Sanatorium, says that the antituberculous horse-serum obtained from the Government Biochemic Laboratory at Washington was used in laryngeal tuberculosis, in doses of 10 mg. gradually increased to 20 mg., with, in brief, the following results: 8 cases showed healing of ulcerations; in 2 the ulcerations were improved and 2 were unimproved; while in 7 laryngeal thickenings showed improvement.

J. E. Stubbett³ insists upon the importance of sanatorium-treatment of tuberculosis. One of the most important features of treatment in institutions is that the patients are obliged to lead a regular life and to be prudent. Stubbett has found **hot-air inhalations** valuable in cases of pleurodynia, asthmatic dyspnea, and purulent bronchorrhea. The antituberculous serum furnished from the Government laboratory was used in 47 cases; three-fourths of the cases improved in every way, and in those cases in which there seemed to be cure no relapses were noticed, so that a certain degree of immunity seemed to have been conferred. Ichthyol and creasote were used with some success.

Williams and Horrocks⁴ have used a **serum obtained from a horse**, after repeatedly inoculating the animal with tuberculin, in the treatment of 9 cases of tuberculosis of the lungs; 5 that were treated with serum obtained 21 days after the final injection of the horse were not improved, but rather lost ground. Smaller doses were used afterward, and the serum was obtained a longer time after the horse was inoculated (72 days in this case); 4 patients were treated, and they showed a decided gain in weight and improvement in the symptoms. The bacilli diminished in 3 cases, but were still present in all at the time of the report.

Ulrich⁵ has treated 7 cases of phthisis with **Maragliano's serum**. He saw no unpleasant reaction, and in all the cases that were accompanied by fever the temperature soon descended to and remained normal. The pulmonary affection and the general condition were not distinctly influenced; but he believes, because of the action on the temperature, that the serum had some antitoxic effect.

A. G. Deardorff⁶ has used Paquin's antituberculous and antistrepto-

¹ Med. News, Mar. 11, 1899.

³ Ibid., July 30, 1898.

⁵ Therap. Monatsh., No. 10, 1898.

² N. Y. Med. Jour., Sept. 10, 1898.

⁴ Brit. Med. Jour., Apr., 1899.

⁶ Jour. Am. Med. Assoc., July 22, 1898.

coccus serums in the treatment of tuberculosis of the lungs. He details 12 cases, 5 of them being in advanced stages of the disease. One of these was fatal, 1 was somewhat improved, 1 greatly improved, 1 well, and 1 patient is still living 6 months after treatment was begun, when death had been expected long before; 3 patients in the third stage showed improvement; in the first there was marked gain, and the second and the third seemed well; 4 cases in the incipient stage seemed to have become entirely well.

W. Freidenthal¹ reports 4 cases of tuberculosis of the lungs and larynx in which he used Fisch's serum. In 1 there seemed to be some improvement, while the remainder showed no good effects and continued to grow worse. C. Fisch² concludes an article on the use of his serum by tabulating 21 cases in which tuberculin-injections were used; 62% improved decidedly. He believes the improvement was probably due to the serum-treatment. A. M. Holmes³ adds a further report upon the use of Fisch's antiphthisic serum. He describes 12 cases which he considers to have been in the pretuberculous stage, and in these the health was restored after the use of serum. Of 4 cases of long standing, 1 seemed cured and 3 much improved; 7 in the early stage with bacilli showed benefit, and some were apparently improved; 8 very rapid cases with mixed infection were not benefited by the treatment except for some improvement in 1 instance. He believes that the serum-treatment of tuberculosis is of value chiefly in incipient cases or in those with but slight extension of the disease. It should be continued for some time after improvement is well established, and may be carried out for a continuous period of 9 months without harm. Climate is, in his belief, an uncertain method of treatment if not accompanied by the use of serum.

Guinard⁴ has used **oxytuberculin in animals experimentally infected** with tuberculosis, and believes that it had distinct antitoxic effects. When injected coincidently with the inoculation of the tuberculus, it seemed to prevent infection.

Meyer and Scognamiglio⁵ have prepared an **extract of the bronchial glands** of sheep, which they term **glandulin**, and have used this in tuberculosis, on the theory that these glands arrest the tubercle-bacilli in favorable cases and prevent general infection, and that therefore they should be useful in treatment. In 30 cases in which it was used they believe that the effects were decidedly good: 6 early cases they thought were entirely arrested, as were 8 in the middle stage; while 6 others in the middle stage were benefited, and 10 in advanced stages improved.

F. Zenker⁶ has devised an apparatus for the purpose of developing the chests of tuberculous patients. This is in the form of a **corset** that fits the back closely, but encircles the trunk only below the umbilicus, the shoulders being drawn back by 2 straps; the effect is to expand the chest and cause deeper inspiration. In 2 children with tuberculosis of the lungs it caused remarkable improvement.

Migelson⁷ has used **immobilization of the thorax** in 30 cases of

¹ Med. News, Feb. 18, 1899.

² Jour. Am. Med. Assoc., Apr. 8, 1899.

³ N. Y. Med. Jour., Mar. 25, April 1 and 8, 1899.

⁴ Lyon méd., July 10, 1898.

⁵ Supplement to Il Policlinico, Jan. 7, 1899.

⁶ Münch. med. Woch., Oct. 11, 1898.

⁷ Méd. mod., July 13, 1898.

tuberculosis, applying a plaster jacket to the whole of the side affected. This was worn without much discomfort in all but 2 cases, and gave good results. The treatment is said to be contraindicated in emphysema, in advanced involvement of the lungs, and in those who are of a neurotic temperament.

J. Bergonié and Tissier¹ have experimented upon the value of the **x-rays** in the treatment of experimental and human tuberculosis. They decide that they are not dangerous, but are without influence upon either the disease or the morphology, vitality, or virulence of the bacillus. The animal experiments rather contraindicate the use of this treatment in human subjects. A. Rodet and H. Bertin-Sans have conducted similar experiments, and find that local trophic disturbance of some gravity is likely to be caused, and that animals commonly do worse when so treated than when not treated. Tuberculous glands decrease in size under the x-rays, but visceral lesions were likely to become more pronounced. Destot and Dubard find that the effects produced by the x-rays are chiefly to be attributed to the electric radiations. R. Mühsam² has investigated the effects of the x-rays on experimental tuberculosis. He finds that general tuberculosis is uninfluenced, while the localized disease shows improvement after the action of the Röntgen rays. This, however, does not necessarily mean that they will produce a cure, or even distinct improvement, in the disease in man. Ousset and Bepart³ state that they have treated a case of chronic tuberculosis of the peritoneum in a young woman, which had been resistant to other measures, by subjecting her to the x-rays, placing the tube about 12 cm. from the abdomen and continuing the exposures for about a half-hour. Such treatment was carried out about 50 times, and within this period the disease seemed to have disappeared.

J. A. de Armand⁴ has decided objections to the **treatment** for consumption **suggested by Murphy**. He particularly directs attention to the fact that it is impossible to cause collapse of the lung in many cases because of the extensive pleural adhesions. Any pressure exerted by the nitrogen driven into the cavity would in such cases merely do harm.

J. T. Whittaker⁵ considers the increase in the number of red blood-cells the most important factor in the cure of tuberculosis at high altitudes. He has attempted to cause an increase in the number of cells by the **administration of blood**, prevented from coagulating by adding to each quart of blood $\frac{1}{2}$ oz. each of sodium bicarbonate and sugar of milk and 1 dram of common salt. A pint of water containing this mixture was added to the pint of blood, and the quart of resulting mixture was injected into the bowel, being retained with ease, and seeming to cause an increase in weight and gain in nutrition, especially in anemic cases. [It is difficult to see how this treatment could exercise any other benefit than that derived from abundant feeding.]

J. Hericourt and C. Richet⁶ have used **turpentine-inhalations** in experimental tuberculosis in dogs, and compared the results with those obtained in control-animals not treated and in others treated with intravenous

¹ Congrès pour l'Étude de la Tuberculose, 1898.

² Deutsch. med. Woch., Nov. 10, 1898.

⁴ Med. Bull., Aug., 1898.

³ Echo méd. du Nord, Nov. 13, 1898.

⁵ Jour. Am. Med. Assoc., Aug. 6, 1898.

⁶ Compt. rend. de la Soc. de Biol., Nov. 18, 1898.

injections of turpentine or intratracheal injections of iodin. They find that the turpentine-inhalations are much the most effective, and certainly saved the lives of 2 dogs and probably prolonged the life of 1.

R. Jacobson¹ has used **oxycamphor** in alcoholic solution, in a dose of about 7 gr. 2 or 3 times a day, in the treatment of dyspnea. His results and those of Senator in his private practice seem to show that this is a valuable symptomatic treatment of dyspnea of pulmonary, cardiac, or nephritic origin.

B. Alexander² recommends **camphor** for the treatment of the late stages of tuberculosis of the lungs. He says that it is particularly valuable in lowering the temperature, sometimes entirely overcoming the fever. It is a cardiac stimulant, and in his experience causes suppuration to decrease and quiets cough. The dose which he usually applies is 0.1 to 0.2 cc. of the German official oil of camphor, which is equal to 0.01 to 0.02 cc. of camphor. After the administration of this for 1 month to 6 weeks he omits the treatment for a week or longer, and begins again. Later the doses are increased to about double the quantity mentioned.

E. O. Otis³ discusses the recent methods of treatment of phthisis, and describes those preferred by him. He insists upon the necessity for **out-door life** and abundant food, rest, with a sufficient amount of exercise if this is possible to the individual, and **hydrotherapy**. He believes that febrile cases should be absolutely at rest, while other cases should take a judicious amount of exercise, usually in the form of walking and breathing exercises. As to the medication, he uses creasote, strychnin, arsenic, or iodoform for the effect upon the general condition. Tuberculin he believes is valuable for diagnostic purposes, and harmless when properly used. The fever should be treated by hygienic rather than medicinal measures. The use of small amounts of alcohol he considers entirely advisable. Antipyretics should not be used unless one is driven to their employment. Night-sweats should be treated in much the same way. Of the medicines in use for this purpose, he recommends most highly camphoric acid, next picrotoxin, then agaricin, and finally atropin. Cough should be treated by counterirritation of the chest, compresses, and demulcent drinks. If sedatives must be used, codein is best.

M. Dimètropol,⁴ believing that the loss of albumins and of **mineral salts** is probably the most important cause of the symptoms in tuberculosis, administers to his cases large amounts of eggs and milk, with large-sized doses of various salts, beginning with table salt, and adding phosphate of lime and phosphate of sodium in doses finally as large as 30 gm. in the day. He attributes some good results to this treatment.

W. Murrell⁵ has investigated the action of a number of the **essential oils** upon cases of phthisis, the individuals constantly wearing an inhaler saturated with a preparation of the oil. No good results were obtained, and examinations of the effects of the oils upon bacteria were negative. He found, however, that a 6% solution of **formaldehyd** caused the growth of tubercle-bacilli to cease when cultures of these bacilli were sub-

¹ Berlin. klin. Woch., Apr. 19, 1899.

² Boston M. and S. Jour., July 14 and 21, 1898.

³ Gaz. hebdom. de Méd. et de Chir., July 17, 1898.

⁴ Brit. Med. Jour., Jan. 28, 1899.

⁵ Ibid., Nov. 28, 1898.

jected to its vapor. He therefore had phthisical patients inhale a 6% solution of formaldehyd; in 12 of 20 cases he saw marked benefit, and in 2 slight improvement. V. Cervello¹ has used inhalations of formaldehyd in 26 patients with phthisis: 10 of these seemed to recover entirely within about 3 months; 9 others were almost entirely well; 2 moderately improved; 1 remained unchanged; 2 were made worse; and 2 died. He believes that the aldehyd increases oxidation.

Berlioz² has used a combination of **horse-serum** and of the **phosphate of guaiacol**, the latter containing 95% of guaiacol, in the treatment of tuberculosis, and claims good results.

T. D. Acland³ reports upon his use of **piperidin guaiacolate** in 2 cases of tuberculosis of the lungs. The first case was considered disseminated tuberculosis of the lungs, without softening. There were no tubercle-bacilli in the sputum. The drug was given in doses of 5 gr. 3 times daily, subsequently increased to 10 gr. The symptoms improved and there was a gain in weight, but the physical signs did not change. In the second case there were tubercle-bacilli in the sputum, and a marked tuberculous family history, and the signs were distinctive of tuberculosis in an active stage. The patient was given 5 gr. of the drug 3 times a day, with some improvement.

A. B. Briggs⁴ reports the use of the **valerianates of creasote and guaiacol** in the treatment of 8 cases of pulmonary tuberculosis. The results in the 3 early cases were good; while in the more chronic cases there was improvement in several instances. He considers the preparations nontoxic and nonirritating, and believes that they act as general tonics and stimulate digestion.

Baureau⁵ uses **creasote phosphate** in doses as large as 6 gm. in a day, and has observed marked improvement in the weight and in the pulmonary signs. Cornil finds that the vapor of **formol**, which of itself is so irritating when inspired, may be readily breathed if mixed with carbonic acid. He uses the combined vapors in the treatment of phthisis, having the mixture inspired for 15 to 20 minutes. He reports excellent results.

H. Goldman⁶ uses a combination of 15 parts each of creasote carbonate and ammonium sulphichthyolate, 30 of glycerin, and 10 of peppermint-water in the treatment of tuberculosis of the lungs, giving of this 10 to 30 drops 3 times a day. He says that it is well borne and readily taken, especially if given in wine, and reports a number of cases in which his results from its use were exceedingly satisfactory.

J. H. Coulter⁷ reports that he constantly uses from 30 to 100 minims of creasote 3 times a day in the treatment of tuberculosis, and has seen no ill-effects from it.

J. L. Salinger⁸ reports 24 cases of tuberculosis of the lung treated by **benzozol**, and describes improvement in all but 2 cases.

Lovtsky⁹ has used subcutaneous injections of a 2½% solution of

¹ Gaz. hebdom. de Méd. et de Chir., June 22, 1899.

² Congrès pour l'Étude de la Tuberculose, 1898.

³ Brit. Med. Jour., July 16, 1898.

⁴ N. Y. Med. Jour., May 20, 1899.

⁵ Congrès pour l'Étude de la Tuberculose, 1898.

⁶ Wien. klin. Woch., Sept. 1, 1898.

⁷ Va. Med. Semi-monthly, 1899.

⁸ Therap. Gaz., Mar. 15, 1899.

⁹ Vrach, vol. xx., No. 1.

sodium cinnamate in the treatment of tuberculosis, and reports that the general condition was improved; sweating became less; there was a tendency to the formation of fibrous tissue and to the cure of incipient disease of the lungs. No harm resulted. The dose given was at first 1 division of a Pravaz syringe, subsequently slowly raised to 6 divisions.

T. J. Mays¹ reports a series of cases of tuberculosis of the lungs in which he used hypodermic injections of **silver nitrate** over the course of the vagi. The results obtained he believed to be good.

Goliner² describes excellent results from the treatment of anorexia of phthisis with **orexin tannate**.

Vossaux³ records 34 cases of phthisis with severe **sweats** which were much improved by the use of **thallium acetate**. In 8 cases he noticed a loss of hair, an unpleasant result observed by others.

J. A. Thompson⁴ states that in the hospital for consumptives with which he is connected cough is never treated by opiates if the patient is able to go to the treatment-room and be given **tracheal injections**. These injections, he finds, relieve the cough more satisfactorily than any internal medication, and have none of the evil secondary effects. The injections are also useful in acute and chronic bronchitis, asthma, and such conditions.

G. Strube⁵ has investigated upon animals the physiologic action of **heroin**, a substitute for morphin, and found that its action is almost identical with that of morphin. He used it in a large number of cases of phthisis for the purpose of relieving cough, decreasing the number of respirations, and producing sleep, and states that it met all these indications very satisfactorily in a dose of about $\frac{1}{15}$ gr. He never gave more than $\frac{2}{5}$ gr. in a day. Morphin habitues were given heroin in place of morphin without causing complaint; but Strube is not prepared to state that they do not become habituated to the drug.

M. Manges⁶ has had satisfactory results from the use of **heroin**, and finds that the unpleasant after-effects are less noticeable than after the administration of other opium-preparations. It quieted cough, and in early tuberculosis of the lungs seemed to reduce the temperature and lessen night-sweats. [We can speak emphatically of the favorable effects of heroin upon the dyspnea of the last stages.]

M. Gallot⁷ used subcutaneous **injections of iodoform** in oil in the treatment of 2 cases of **hemoptysis**, the dose being $\frac{3}{4}$ gr. per day. He considers the results decidedly favorable.

J. D. Thomas⁸ reports a series of cases of hemoptysis that were treated by the hypodermic use of **atropin**, with good results, the bleeding usually ceasing within a few moments after injection of the drug. He thinks it probably acts by lowering the blood-pressure.

¹ Phila. Med. Jour., Feb. 11, 1899.

³ Thèse de Paris, 1898.

⁵ Berlin. klin. Woch., Nov. 7, 1898.

⁷ Gaz. hebdom. de Méd. et de Chir., Sept. 1, 1898.

⁸ Phila. Med. Jour., July 16, 1898.

² Bull. méd., p. 764, 1898.

⁴ Therap. Gaz., Oct. 15, 1898.

⁶ N. Y. Med. Jour., Nov. 26, 1898.

RHEUMATISM.

Etiology.—Carrière¹ found **Achalme's bacillus** in the liquid removed from the pleura in a case of acute articular rheumatism complicated by pleurisy.

Reinhard² believes that rheumatism is an infectious disease, and that the infection probably gains entrance through the mucous membrane of the mouth. He therefore advises careful **cleansing of the mouth** at frequent intervals. He describes a case that occurred in a man of 32, who had for 10 years persistently recurring attacks of articular rheumatism, the attacks ceasing entirely after the removal of enlarged tonsils and careful cleansing of the throat. The relation between chronic rheumatism and throat-infections, if it exists, is difficult to show; but a case is mentioned in which chronic catarrh of the pharynx was associated with chronic rheumatic pains, and in which the rheumatic symptoms disappeared after the cure of the pharyngitis.

Rabl³ believes that the teaching that rheumatism is an infection which enters through the mucous membranes is ridiculous, and considers that the disease is due to **disturbance** of the secretory **activity of the skin**. He finds that in Australia rheumatism is very common, while inflammation of the mucous membranes is rare, and this he believes is an evidence that in that hot climate the skin-functions are likely to be deranged owing to the severe demands made upon them. Therefore rheumatism becomes frequent. [Similarly scientific reasoning might be applied to many definite infectious diseases.]

Complications.—R. T. Ferguson⁴ saw **hyperpyrexia** occur on the sixteenth day of an attack of subacute rheumatism. The temperature rose so high as 107.4° F., and remained at about this height for 12 hours. It fell, however, and recovery ensued.

C. Garnier⁵ describes 2 cases of **phlebitis** in acute rheumatism, and refers to the records of Vidal and Sicard, who in 1896 could find but 16 cases in the literature. The first case here reported was in a man of 48, who had endocarditis, and showed the symptoms of phlebitis on the fifty-eighth day of the disease. The veins of the right leg were first affected, while later the basilic veins on the left side became involved. The patient had almost recovered at the time of his discharge from the hospital. The second case occurred in a boy of 19, who also had endocarditis, and when admitted on the eighth day of the attack of rheumatism had a phlebitis of the internal saphenous, which rapidly improved. Garnier has collected 28 cases of rheumatic phlebitis, and suggests that it is not so uncommon as is usually supposed. The lower limbs were affected in 23 of the cases collected. Combemale and Hérin⁶ report a case of rheumatism associated with phlebitis. The symptoms of phlebitis began about 10 days before those of the rheumatism, and continued until the outbreak of the latter became typical.

M. Rothmann⁷ reports a case of **atrophy of the deltoid**, with

¹ Compt. rend. de la Soc. de Biol., July 9, 1893.

² Münch. med. Woch., Sept. 17, 1898.

³ Ibid.

⁴ Brit. Med. Jour., Jan. 21, 1899.

⁵ Progrès méd., Feb. 25, 1899.

⁶ Gaz. hebdom. de Méd. et de Chir., June 8, 1899.

⁷ Deutsch. med. Woch., June 8, 1899.

inability to abduct and elevate the arm, consequent upon rheumatism. The man was entirely cured by carrying out movements intended to develop muscles collaterally active in elevating the arm, chiefly the pectoralis major, the serratus anticus major, and the supraspinatus. The body was bent toward the unaffected side, the shoulder elevated, the arm adducted and held in pronation, and then strong efforts were made to elevate the upper arm. Repetition of this produced marked development of the muscles mentioned, and even a definite improvement in the atrophic deltoid.

Baurowicz¹ describes a case of **rheumatism** in which the disease began in the **cricoarytenoid joints**.

Treatment.—Lancereaux and Palesco² report excellent results from the treatment of chronic rheumatic affections, gouty arteriosclerosis, and various vasomotor troubles by the use of **iodothylin**.

Harlet³ states that he has become convinced, from the **rectal use of sodium salicylate**, given in doses of 8 to 10 gr. daily in 2 enemas, that this method of administration relieves the pain more rapidly and does not disturb digestion. The dose mentioned is given for 2 days, and is then diminished 1 gr. daily. He has found this useful for the acute and subacute forms of rheumatism and for gonorrheal arthritis.

Render⁴ describes a case of acute rheumatism in which the use of 6 gm. of **sodium salicylate** daily caused the appearance of **violent delirium**, and at the same time the urine became very scanty and contained much albumin, and indicanuria was pronounced. After stopping the drug the symptoms disappeared, with the exception of the albuminuria, which persisted for some time.

Burghart⁵ has used **pyrosal** and **phenosal** with satisfaction in acute rheumatism. The action was thought to be more prompt than that of the salicylates, though not more permanent. The dose was about 8 gr., 2 to 6 times a day.

Robin⁶ reports 7 cases of acute articular rheumatism and 1 of acute gonorrheal rheumatism treated with **methylene-blue**. The result was a rapid and continued amelioration of the symptoms. There were no unfavorable results.

W. H. Marey⁷ records a case of **gonorrheal rheumatism** treated by repeated injections into the joints of 60 minims of a 1:3000 solution of **mercuric chlorid**, with the result that the symptoms disappeared after having been resistant to other treatment.

C. K. Martyn⁸ notes that after administering altogether 40 gr. of **antipyrin** to a man with rheumatic neuralgia, a **stomatitis** appeared as an evidence of intoxication.

A. Bier⁹ has had very good results from treating chronic articular rheumatism with **hot air**; and believing that the favorable effects were due to the hyperemia produced, he thought that still better effects might be obtained by causing passive hyperemia mechanically. He therefore

¹ Arch. f. Laryng., Band 9, Heft 1.

² Klin. Therap. Woch., No. 32, 1898.

³ Gaz. hebdom. de Méd. et de Chir., Nov. 3, 1898.

⁴ Deutsch. med. Woch., Oct. 13, 1898.

⁵ Bull. de l'Acad. de Méd., Feb. 3, 1899.

⁶ Brit. Med. Jour., Sept. 17, 1898.

⁷ Bull. de l'Acad. de Méd., Jan. 3, 1899.

⁸ Med. Rec., July 2, 1898.

⁹ Münch. med. Woch., Aug. 2, 1898.

applied rubber bandages tightly above the affected joints, after having previously applied a cotton bandage to the limb from its distal portion to a point just beneath the afflicted joint. The bandages were often allowed to remain on so long as 12 hours, and the results from this treatment were such as to give Bier great encouragement.

T. S. Short¹ records his results from the treatment of arthritis by **hot-air baths**. He places the patient uncovered within a tent having an opening at the top to permit escape of the hot air, and thus to prevent saturation of the air by moisture. The temperature is recorded by means of a thermometer introduced through a hole in the tent. If the hot air is allowed to escape for a time after free perspiration has come on, the temperature can be elevated to 200° F.; though this should not be attempted at first. He has found it especially valuable in subacute rheumatism, whether due to the typical or pyemic conditions; also in gout, in chronic thickening resulting from acute rheumatism or from rheumatoid arthritis, and in cases of loss of mobility, the result of injury or disease.

S. Salaghi² describes an **electric apparatus** for the production of **superheated air** in the treatment of joint-conditions, etc. The advantages are that it takes up but little room and is much more convenient for the patient, since it allows of the use of a flexible apparatus, and the patient may be moved during the treatment, and may therefore be made more comfortable. It may be used with an ordinary electric-lighting current. W. Taylor³ describes an electric apparatus for the purpose of treating neuralgia and rheumatism, and records a number of cases cured by the use of this apparatus after other treatment had been found useless.

G. M. Blech⁴ has had thoroughly satisfactory results from the use of **dry hot air** in traumatic, rheumatic, and gouty arthritis, as well as in sciatica and muscular rheumatism.

J. O'Connor⁵ reports the treatment of 2 cases of acute articular rheumatism by **opening the joint** affected and making irrigation, subsequently packing the wound with bichlorid gauze. In one case he operated upon an ankle, elbow, and knee coincidently; in another case an operation was undertaken at one time upon both wrists and one knee. He states that the rapidity of the subsequent improvement was remarkable, and believes that surgical intervention is advisable in all cases that do not show reasonable response to medicinal treatment.

Rhizomelic Spondylosis.—P. Marie and Léri⁶ report the findings in an **autopsy** upon a case of **rhizomelic spondylosis**. Contrary to expectation, there was no ossification of the intervertebral disks, excepting in the anterior portion of some of those in the lumbar region; but the ligaments were entirely ossified and transformed into bony bands, and the apophyses were bound together by bony ankylosis and were enlarged. Radiographs taken from other cases of rhizomelic spondylosis showed similar changes. Spillman and Etienne⁷ record a case which they believe belongs to the class which Marie has described as rhizomelic spondylosis. It occurred in a man of 53, whose previous

¹ Brit. Med. Jour., Nov. 26, 1898.

² Münch. med. Woch., Aug. 2, 1898.

³ Lancet, Nov. 26, 1898.

⁴ Phila. Med. Jour., Feb. 25, 1899.

⁵ Glasgow Med. Jour., Sept., 1898.

⁶ Bull. de la Soc. méd. des Hôp.

⁷ Rev. de Méd., Sept. 10, 1898.

history had been without incidents of importance. His trouble began with weakness in the right leg, then in the left leg, and restriction in the movements of the hips; the spine became ankylosed, and there was entire ankylosis, with some external rotation, at the hip-joints. The other joints seemed free. The patient, unlike the case reported by Marie, had been entirely free from pain, and his general nutrition had not suffered. The disease had persisted for 4 years.

INTOXICATIONS RESEMBLING INFECTIONS.

G. Rosenfeld¹ describes 2 cases in which there were severe constipation, vomiting, inanition, and marked depression. In 1 case there was marked tendency to stupor. Both showed a considerable quantity of acetone and diacetic acid in the urine, and the phenyl-hydrazin test was positive; but in neither case was there diabetes, and neither showed alimentary glycosuria. Both cases are believed to have been **gastrointestinal autointoxication**.

G. W. McCaskey,² in discussing the question of autointoxication, describes a case of **severe anemia** in which the red cells were reduced to about 1,000,000, and the leukocytes were increased to a ratio of 1:12; the patient had chronic intestinal disturbance. Microscopic examination of the feces showed great numbers of small tenias, which could not be identified, and abundant colon-bacilli. The case was treated by disinfection of the intestine, the red cells increasing about 1,000,000 within 2 weeks; the white cells becoming normal. The cause of the condition was believed to be absorption of chemotactic proteids or of some bacterial products which produced the leukocytosis; while the very rapid subsequent production of red cells is believed to show that the poisons mentioned had a strongly unfavorable influence upon the hematogenetic functions.

A. M. Davis³ believes that autointoxication is of great importance in the causation of **neurasthenia** and of many **mental affections**. He describes 2 cases that showed severe mental symptoms in conjunction with profound neurasthenia, both patients having some disturbance of the gastrointestinal tract. When the latter was treated and the local condition was improved the nervous symptoms grew constantly better, and finally disappeared.

H. E. Durham⁴ discusses the present knowledge of outbreaks due to **meat-poisoning**. He considers 2 bacilli directly related to these outbreaks—the *Bacillus enteritidis* of Gärtner and the *Bacillus butyricus* of van Ermenghem. In 4 outbreaks which Durham has investigated, the *Bacillus enteritidis* was isolated in 1, and serum-diagnosis showed that in the 3 others the same organism was the cause. When the source of the disease has been traced, the animal from which the meat was obtained has been found diseased. The cow and calf are most likely to furnish meat so infected. In 2 of the 4 epidemics observed by Durham, veal and beef were responsible. Infection through milk is uncommon. The disturbance usually begins with chill, fugacious fever, prostration, diarrhea, vomiting, rashes, severe thirst, and often jaundice. Convalescence

¹ Centrabl. f. innere Med., July 23, 1898.

² N. Y. Med. Jour., Oct. 22, 1898.

³ Med. Rec., Oct. 29, 1898.

⁴ Brit. Med. Jour., Dec. 17, 1898.

is likely to be protracted, and when the disease is continued for some time it is likely to resemble typhoid fever. It can be prevented by careful inspection of animals before slaughtering.

J. W. Moore¹ describes 3 forms of **oyster-poisoning**, the mildest of which is an acute gastroenteritis; the second form is a continued fever, which persists for about 10 days and is accompanied by great depression of body and mind, and may end fatally through heart-failure, profound nervous symptoms, or peritonitis; the third form is actual typhoid fever acquired from eating the oysters.

J. Cahill² records 3 cases in which **violent vomiting** ensued upon the eating of soup in which some bones of a wild duck had been used. When other portions of the same bones were given to a cat, the animal showed similar symptoms. The cases are believed to be instances of ptomain poisoning resulting from the use of the duck's bones.

W. McD. Struble³ reports 8 cases of **poisoning from toadstools**, in which the symptoms consisted chiefly of vomiting, which was painless and apparently centric, followed by free serous diarrhea and severe depression of the heart. Three of the cases died from cardiac failure. The poison was found to be due to the *Amanita phalloides*, differing considerably in the symptoms from that produced by the *Amanita muscaria*. The treatment should be free vomiting and purgation, followed by stimulation and the subcutaneous use of salt solution.

Matignond⁴ describes a variety of food-poisoning which he calls **atriplicism**. It is produced by eating a variety of spinach (*Atriplex serrata*), and results only from eating the uncooked herb; it is therefore probably due to toxic products or parasites. It causes a painful infiltration of the backs of the hands, forearms, and face. The skin becomes exceedingly sensitive to heat and light, so that an experienced person may diagnose the disease by seeing the manner in which the subjects protect themselves from sunlight by wrappings. There is no albumin in the urine; but there is marked bradycardia, and the temperature is often subnormal. Later, ecchymosis appears on the affected area, and ulceration commonly occurs, sometimes to such an extent as to result in deforming scars, in which keloid is likely to develop. In 1 case gangrene of the fingers followed.

DIATHETIC DISEASES.

GLYCOSURIA.

T. Raphael⁵ presents an elaborate study of **alimentary glycosuria**. He compared the results produced in persons who have glycosuria after taking starches when he administered carbohydrates to them in the form of starches at one time and at another in the form of grape-sugar. The grape-sugar caused much more marked excretion of sugar, sometimes 10 times as much as after using starches. The rapidity of appearance of the sugar and the duration of its excretion differed little. He also found that persons who excrete sugar after using starch show a much more marked

¹ Practitioner, Mar., 1899.

² Lancet, Oct. 29, 1898.

³ Med. News, May 27, 1899.

⁴ Med. Rep. of Chinese and Maritime Customs, 1898.

⁵ Zeit. f. klin. Med., Band 37, Hefte 1 u. 2.

glycosuria after taking 100 gm. of grape-sugar than do those who show glycosuria after using this amount of grape-sugar, but do not show glycosuria after using starches. Raphael says positively that when a person who has previously had diabetes does not show excessive alimentary glycosuria after the administration of grape-sugar, it must be considered that his diabetes is at least temporarily cured. The duration and rapidity of occurrence of alimentary glycosuria were about the same in those who had glycosuria after using starches and in those who did not. The excretion of sugar in the same person was not always proportional to the amount of sugar administered; and the amount excreted by the same person after the same dose varied at different times. Therefore a single result in the testing of alimentary glycosuria is not final. [These and the similar experiments of others warrant the conclusion that the phenomena of alimentary glycosuria are explainable on the basis of the permeability of the intestines to carbohydrates and of the varying ability of the organism to destroy sugars.]

L. Breul¹ has inquired into the presence of sugar in the normal urine as the result of changes of diet, using himself as the subject of experimentation. He was perfectly healthy, had no tendency to diabetes, and found that when he took a carbohydrate diet or one purely of meat there was glycosuria, with the excretion of from 0.36 to 1.95 gm. of sugar per day. Sugar was absent when he fasted, but it reappeared as soon as food was taken. This **physiologic glycosuria** was most marked when there was decided restriction of muscular exercise and of heat-radiation. His method for estimating the sugar was that of Laves.

H. Strauss² studied the question of the **relation of the liver to glycosuria** by attempting to produce alimentary glycosuria in 38 cases of liver-disease and in frogs whose livers had been removed. In human subjects with disease of the liver, after administering 100 gm. of glucose in 500 cc. of water on an empty stomach, glycosuria occurred in only 2 cases, and both of these had been injured in the region of the liver. Strauss thinks the nervous shock probably of more importance than the liver-disease. The frogs operated upon were not more susceptible to alimentary glycosuria than normal control-animals; and Strauss decides that liver-disease alone probably never produces diabetes, and that lesions of this organ are either accidental, or are the result either of the same cause that produced the diabetes or of the diabetes itself.

Bierens de Hann,³ in answer to Strauss's statement that de Hann's positive results in investigations for alimentary glycosuria in liver-disease were due to the presence of fever or other causes of error, states that such conditions were absent in his cases. He attributes the difference between his results and Strauss's to the fact that he gave 150 gm. of cane-sugar at night, while Strauss gave 100 gm. of grape-sugar in the morning, on an empty stomach.

M. Arndt⁴ investigated 96 cases of **functional disease of the nervous system** concerning the presence of glycosuria. Only 2 of 31 hysteric patients showed it; it was present in none of 7 hypochondriacs; while 5 of 21 cases of melancholia and all of 4 instances of traumatic neuroses showed it. The functional neuroses not due to trauma showed

¹ Arch. f. exper. Path., Band 40.

² Ibid., Jan. 30, 1899.

³ Berlin. klin. Woch., Dec. 19, 1898.

⁴ Ibid., Dec. 5, 1898.

it in about 14% of the cases. The traumatic cases showed much more marked tendency to it; it was produced in nearly 33% of traumatic neuroses.

R. B. H. Gradwohl¹ reports the case of a man of 46, who had a sudden **apoplexy**, and showed for a time about 3% of sugar in his urine. This vanished after a few hours, and death occurred. Glycosuria was believed to be due to the pressure, upon the fourth ventricle, of a blood-clot that was present in and filled all the ventricles. [As the man had never been seen before, there was no record of the previous condition of his urine.]

Bettmann² found that a young man who had taken **copaiba** for gonorrhea, and who had up to that time been entirely well, **developed glycosuria** and excessive appetite and thirst. He found by investigation of other cases that sugar appeared in the urine after the use of copaiba, and that it was possible to produce alimentary glycosuria after the use of this drug when the individual had not previously shown it. The man first mentioned had been taking, at his own instance, excessively large doses, and there was a history of diabetes in his family. Bettmann therefore utters a warning against the use of very large doses of the drug, and thinks that it should be used only with much caution in persons who show any tendency to diabetes. The man disappeared from observation while sugar was still present in his urine.

Brocard³ found **glycosuria** in 60 of 125 **pregnant women** examined. The sugars found were chiefly glucose and lactose. Alimentary glycosuria was produced in a number of these cases by the indigestion of from 50 to 100 gm. of glucose, even in those who showed no evidence of disease of the liver. Charrin, in discussion, suggested that the excess of fat usually found in the livers of pregnant women may explain their tendency to alimentary glycosuria, since the latter occurs readily in fatty liver. Brocard believed it due rather to disturbance of general nutrition.

A. Exner⁴ tested the urine of 40 cases of **cholelithiasis** for sugar, and found it in all but 1 in small amounts. He considers its presence of diagnostic importance in obscure cases. It could not be determined whether the production of glycosuria depended upon obstruction of the cystic duct, the common duct, or both. The diagnosis was confirmed by operation in many cases, and the sugar disappeared after removal of the stones.

Zinn,⁵ on the contrary, in studying 89 cases of cholelithiasis for the presence of sugar in the urine, found it in but 2, and then for a short time only. Adding his own results to those of Naumyn in 250 cases, he decides that sugar is present only very rarely.

W. Kausch⁶ has investigated 85 cases of cholelithiasis as to the presence of glycosuria. In but 1 instance did he observe this condition, in a patient who had had biliary colic at intervals for 7 years. In many of the cases, however, but 1 examination was made.

C. Achard and E. Weil⁷ report that saccharose, invert-sugar, glucose,

¹ Phila. Med. Jour., Apr. 22, 1899.

² Berlin. klin. Woch., May 29, 1899.

³ Compt. rend. de la Soc. de Biol., Dec. 3, 1898.

⁴ Deutsch. med. Woch., Aug. 4, 1898.

⁵ Centralbl. f. innere Med., Sept. 24, 1898.

⁶ Deutsch. med. Woch., Feb. 16, 1899.

⁷ Bull. de la Soc. méd. des Hôp., July 22, 1898.

and lactose have marked **diuretic action** when administered in doses of 100 to 150 gm.; and that marked polyuria follows the subcutaneous injection of much smaller quantities of these sugars. The amount of urine was repeatedly increased by their use in patients with pronounced oliguria; the nitrogenous elements in the urine also increased. Oftentimes urobilinuria and indicanuria appeared several hours after the use of the sugars, most frequently in those who readily showed alimentary glycosuria.

DIABETES.

Etiology and Pathology.—F. H. Harris¹ describes a case of diabetes which appeared in a man of 42, shortly after an attack of **mumps**. This led him to extirpate the salivary glands of a dog to see whether diabetes could be produced in this way. Small quantities of sugar did appear in the urine; also in a man of 63, who died of tuberculosis complicating diabetes, the salivary glands showed marked alterations similar to those found in the pancreas. These were chiefly overgrowth of the connective tissue with round-cell infiltration and atrophy of the glands, and in some places their entire disappearance.

Manchot² gives a critical review of the literature concerning essential **syphilitic diabetes** without local lesions of the central nervous system. He reports 4 cases in which syphilis and diabetes were associated; in 2 of them gummas were present. In both of these the use of innjections and potassium iodid relieved the diabetes and reduced the gummas. In the other 2, autopsies showed marked atrophy of the pancreas. The author thinks that this atrophy was essentially syphilitic, and that the diabetes was therefore probably dependent upon the syphilis. He has observed 12 cases of transitory glycosuria among 359 syphilitic persons, and thinks the glycosuria should be attributed to the syphilis. In 1 it occurred just before the general symptoms of syphilis; in 8 with them; and in the remaining 3 it appeared later. He thinks that the glycosuria may be the result of disease of the pancreas, and possibly of the liver also, which may be amenable to successful treatment. [Other writers have recently discussed the relationship of syphilis to diabetes without reaching any explanation of the apparent influence of the former. (See Naunyn in Nothnagel's collection of monographs.)]

Cipriani³ describes a case of **pancreatic calculus** in a boy of 15, who had previously had malaria. He had repeated attacks of violent pain in the epigastrium, followed by fatty diarrhea, salivation, excessive thirst, glycosuria, fever, and great weakness. Finally a stone was passed, and subsequently the patient became entirely well. Besides medicinal treatment, Cipriani used daily 20 gm. of levulose, which was well borne and improved the general nutrition.

Gudden⁴ reports the occurrence of symptoms of diabetes after a **fracture of the skull**. The patient had previously been entirely well.

Teschemacher⁵ describes his experience in **1231 cases** of diabetes, of which 875 were in men. Over 800 cases occurred between the fortieth

¹ Boston M. and S. Jour., May 18, 1899.

² Monatsh. f. prakt. Dermat., Band xxvii., Hefte 5 u. 6.

³ Therap. Monatsh., No. 11, 1898.

⁴ Friedreich's Blätter, Heft 1, 1899.

⁵ Centralbl. f. d. Krankh. d. Harn. u. Sexualorg., No. 3, 1899.

and sixtieth years of life, and three-fourths of them dwelt in large cities. There was evidence of heredity in many cases. He saw 8 instances of conjugal diabetes. The most common apparent causes were injury to the head, and severe nervous shock and overstrain. In 9 instances there were definite signs of *tabes dorsalis*, though it is, of course, unknown whether there is any causal relation between the two. In 2 cases syphilis seemed responsible for the disease; in 4 it followed typhoid fever; in 3, acute rheumatism; in a number of cases severe gastric disturbance had preceded. Many cases gave a history of severe influenza, and in 2 instances the disease appeared immediately after exposure to wet and cold. There were 3 instances of typical intermittent diabetes. The most protracted cases lasted 20 years. The most severe glycosuria was in an individual who passed 575 gm. of sugar daily. In 1 case the amount of sugar reached 12%; and in this case it is noteworthy that the amount of urine was very low. Excessive appetite was observed only in the very grave cases. Teschemacher bases his prognosis chiefly upon the possibility of controlling the glycosuria by diet, as he considers this the best indication of the severity of the disease. The absence of the patellar reflex does not necessarily indicate great gravity. Pregnancy has a very unfavorable influence. Codein was the only drug of marked usefulness. Albuminuria occurred in 262 cases. In 6 cases he noticed distinct edema of the feet and ankles, without signs of circulatory failure, for which he offers no explanation.

Fnnaro¹ notes the frequency of **diabetes in Tunis**. Here, as elsewhere, Hebrews are most frequently affected. The general prevalence of the disease Fnnaro attributes to the excessive use of starchy and other sweet foods, and to the extremely sedentary life led by the natives. He has observed but 1 instance in which it seemed possible that the disease was due to malaria, and states that it is uncommon in regions in which malaria is especially common and severe. Heredity seemed to play a very pronounced rôle, and obesity was often present. The infection was usually mild and rarely complicated by tuberculosis.

Symptomatology.—R. H. Fitz and E. P. Joslin² present a paper on diabetes, based upon a study of the records of the Massachusetts General Hospital from 1821 to 1897. During this time there were 172 cases, of which 74% were males. In many instances the records were very imperfect. The average age was 33 years. In 10 of 42 cases in which this point was noted, there was hereditary tendency. Forty-seven cases were fatal. In the postmortem examinations of 15 cases but slight changes were found in any organs. In 1 instance the sugar present reached 12%; the largest amount of urine passed in 1 day was 576 oz. In 60% of the cases albuminuria was present. Upon an average the disease lasted 1½ years, though the majority of the cases proved fatal within 1 year. Of the fatal cases, 38% terminated in diabetic coma.

Lenne³ states that he has often observed the so-called **diabetes decipiens**, in which there is an excretion of but a moderate amount of urine. He does not consider these as forming a special group of cases, since he thinks that there is a small amount of urine excreted because a small amount of water is drunk.

¹ Gaz. méd. de Nantes, Aug. 6, 1898. ² Jour. Am. Med. Assoc., July 23, 1898.

³ Deutsch. med. Woch., No. 32, 1898.

T. Rumpf¹ states that it is erroneous to consider that all diabetics have some **power of assimilating carbohydrates**, since in 4 of the cases of severe diabetes which he has investigated he found that the excretion of carbohydrates was as large or larger than the ingestion; hence there was no assimilation. He finds, further, that carbohydrates in such instances do not even prevent nitrogen-waste; indeed, a nitrogen-loss often persists after carbohydrates are stopped, and this he considers due to persistence of the increased glycosuria even after the carbohydrates have been stopped; the loss of sugar is replaced by breaking up of the body-proteids. In cases that show no power of assimilation, Rumpf insists that the use of bread and milk and of similar foods must be absolutely forbidden, in order to prevent increased nitrogen-loss.

T. Rumpf² discusses the excretion in certain cases of diabetes of an amount of sugar greater than that present in the diet; he attributes this to **decomposition of proteids** and the **production of sugars** from them. He describes a case in which this excessive excretion of sugar occurred, and follows it by the report of another case, in which the contrary occurred; also a case in which the sugar-excretion was so excessive that it could not have come entirely from decomposed albumin; therefore he decides that much of it must have come from destruction of fats, chiefly the glycerins. [The question of the production of sugar from true proteids, while clinically probable, is as yet mere speculation.]

J. Seemann³ has attempted to produce carbohydrates from albumin. He first freed the albumin as much as possible from mucoid substances, and then treated the mucoid substances and the albumin separately, and was able to obtain from both a substance which gave the chemical, polarimetric, and crystallographic tests for glucosamin hydrochlorate. The author states, however, that since he obtained but a small percentage of this material from the proteid and a considerable amount from the mucoid, it seems quite possible that the whole amount apparently obtained from the proteids really came from the mucoid substance that had not been separated from the proteids, in spite of his attempts to do so.

S. Mascarel⁴ notes that the amount of sugar excreted in diabetes is not necessarily proportionate to the degree of hyperglycemia, and a disproportionately slight glycosuria is due to defect in the **permeability of the kidney**. The degree of permeability of the kidney is of much importance, in his belief, in establishing a prognosis, and is determined by the administration of methylene-blue subcutaneously or by the mouth, and the determination of the rapidity with which it appears in the urine. He thinks that there is not yet sufficient reason for considering there is a diabetes dependent upon excessive permeability of the kidney to sugar.

Waldvogel⁵ prepared **beta-oxybutyric acid** from the urine of a patient with diabetes, and investigated its effect upon lower animals when administered by the stomach and by subcutaneous injection. One animal that had taken large amounts of the acid showed Legal's reaction in the urine for several days; subcutaneous injection caused local necrosis and some nephritis. Intravenous injection into rabbits resulted in no symptoms of poisoning; the sodium-salt of the acid, however, produced a con-

¹ Berlin. klin. Woch., Oct. 24, 1898.

² Ibid., Feb. 27, 1899.

³ Arch. f. Verdauungskrankh., Band iv., Heft 3.

⁴ Thèse de Paris, 1897-1898.

⁵ Centrabl. f. innere Med., Aug. 20, 1898.

dition similar to diabetic coma when used in frogs and mice; this condition persisted for but a few minutes.

K. Grube¹ discusses the various kinds of **albuminuria found in diabetes mellitus**. Albuminuria is most usually found in association with diabetes in the sixth decade, but is also extremely common in the eighth decade. Arteriosclerosis, gout, and alcoholism are believed to be active in causing it. Five forms of the albuminuria are described: First, that form which occurs with severe cases of diabetes, but which is never very considerable, and is seen chiefly in the later periods of the disease. Second, the albuminuria produced by weakness or failure of heart-action. Third, a senile albuminuria, which is slight and seen chiefly in people beyond 70 years of age, and is due largely to arteriosclerosis; this, however, is seen in an earlier period of life in diabetes than in other conditions, as an albuminuria seemingly due to this cause has been repeatedly noticed in diabetics but little beyond 50 years of age. This form is likely to last without much change for years; it commonly does not tend to grow worse. The urine usually does not contain casts nor other morphologic elements. Fourth, there is a functional albuminuria which occurs chiefly in those who have passed a large amount of sugar in a short time; this is probably due to irritation of the kidneys by the large quantity of sugar in the urine. The fifth is an albuminuria due to chronic renal disease, the continued irritation of the passage of sugar finally leading to actual nephritis.

R. G. Cookson² describes a **rapidly fatal case of diabetes** that resulted in death 2 months after the patient became aware that he was ill. The first symptom was a boil. This was followed by weakness, which increased excessively rapidly, and was soon accompanied by the usual general symptoms of diabetes. Death occurred in coma. [The occasional latency of diabetes has been noted by all writers on the subject.]

Boehm³ reports an instance of what he believed to be acute diabetes in a boy of 17. His symptoms had existed for only about 2 weeks. They consisted for several days of languor, excessive thirst, headache, and polyuria. He then became comatose, and soon died. The discovery of chronic disease of the kidneys and atrophy of the pancreas upon post-mortem examination showed that the cause of the condition must have existed for a long time.

Complications.—Roget and Balvay⁴ describe a case of diabetes interesting in regard to the previous history and the curious relation with **hysteric manifestations**. The man was syphilitic and alcoholic. He had had severe malaria, and had also suffered from violent trauma to the head. When admitted he complained only of a peculiar pain over the whole left side, similar to that caused by a stream of very cold water. The senses of heat and cold were inverted on this side. He had auditory hallucinations; subsequently he became typically hysteric and had pronounced convulsions. The urine contained large quantities of sugar, as well as acetone, diacetic acid, and oxybutyric acid. Later he had slight facial paralysis on the left side, and the next day became comatose. Repeated injections of sodium-chlorid solution caused improvement, over 8

¹ Brit. Med. Jour., July 25, 1898.

³ Münch. med. Woch., Aug. 30, 1898.

² Austral. Med. Gaz., July 20, 1898.

⁴ Lyon méd., Jan. 8, 1898.

liters being given within 6 days. The patient finally recovered entirely from the coma, but died 4 months later from purulent pleurisy.

A. Gilbert and E. Weil¹ record the occurrence of **biliary lithiasis** in 2 women with diabetes. In both cases the sugar disappeared almost entirely with an attack of colic, and returned after the termination of the biliary crises. They think this action of the biliary pain is probably reflex.

T. W. Parry² describes the case of a woman of 68, who, he thinks, died of **diabetic coma**, without having shown previous symptoms. Coma appeared with much suddenness. The sphincters were paralyzed, the knee-jerks absent, and the urine contained large quantities of glucose. Apoplexy was thought to be excluded because of the normal condition of the heart and the absence of signs of atheroma or increased vascular tension.

N. S. Davis, Jr.,³ reports 3 cases of **gangrene** which occurred in diabetic individuals: in 1 the fingers were affected; in 1 there was perforating ulcer of the foot; and in 1 the feet were symmetrically involved. In all cases the sugar disappeared from the urine largely or entirely, and health improved greatly when the gangrenous portion sloughed. When this was past the sugar returned, and the health once more became impaired. Davis believes that arteriosclerosis is largely causative of the condition, sometimes without other causes, sometimes acting in conjunction with diseases of the tissues, as, for instance, gangrene of the lungs in connection with tuberculous of these organs. He states that he advises amputation if the gangrene is limited to the toes. In the discussion that followed, there was much doubt expressed as to the wisdom of advising amputation.

Weil⁴ presents the records of 2 cases of **cancer of the kidney** which occurred in diabetic subjects and had shown a very rapid course. In 1 case, in a man of 34, the tumor had existed for about 12 years, and had shown a malignant character only after the appearance of the diabetes.

Treatment.—P. F. Richter⁵ used caffein preparations to study the effect of certain drugs upon glycosuria. The administration of diuretin caused glycosuria. Glycerin had no controlling effect upon this, and therefore did not limit saccharification of the liver-glycogen, and even seemed to produce glycogen, since sugar appeared in the urine after administration of glycerin with diuretin. When a carbohydrate diet was used, however, and opium was given after the diuretin, glycosuria did not occur unless the carbohydrates were used in excessive quantities or the animals experimented upon had been starved for some time. It seemed, therefore, that opium controlled the saccharification of the glycogen of the liver, and this was proved by finding the amount of glycogen in the liver greater after administering opium with diuretin than in control-cases of diuretin-glycosuria to which no opium had been given. Antipyrin had a similar but less pronounced effect. Alkalies had practically no effect; jambul was without influence upon the glycosuria, and in Richter's opinion is not likely to be of value in diabetes.

¹ Bull. de la Soc. méd. des Hôp., July 22, 1898.

² Lancet, Nov. 26, 1898.

³ Jour. Am. Med. Assoc., July 16, 1898.

⁴ Comp. rend. de la Soc. de Biol., Dec. 3, 1898.

⁵ Zeit. f. klin. Med., Band xxxvi., Hefte 1 u. 2.

R. Lépine,¹ in a general discussion of the **dietetic treatment** of diabetes, insists upon the danger of exclusive proteid diet. He allows fats in as large a quantity as can be digested, though he thinks that in 1 instance the use of cream caused such a large increase in the sugar-excretion that probably some fat was converted into carbohydrate. He believes in preliminary restriction of the carbohydrates over a considerable period, their resumption being best begun by the use of small quantities of bread. He thinks fruits should be more freely used, and especially mentions apricots as containing little sugar, most of which is levulose. Saccharin has in his experience produced no bad results. The use of milk must depend upon the patient; such preparations as koumyss or kephyr are usually valuable, since they are diuretic and the sugar has been broken up by fermentation.

H. Leo,² in discussing the treatment of diabetes mellitus, stated that he had become convinced that the most important point is to **exclude the carbohydrates** as much as possible through certain periods, in order to free the urine from sugar, subsequently allowing freer diet, and repeating the periods of abstinence several times a year.

R. Lépine,³ in a critical review of the treatment of diabetes, states that in cases associated with obesity he has had good results from **potassium permanganate**, he thinks, through its oxidizing effect. He advises the use of manganese dioxid for the same purpose. He also recommends a greater amount of muscular exercise than is commonly thought advisable, since this increases glycolysis. His results from anti-pyrin have oftentimes been very good, even when opium was unsatisfactory. Jambul has given him good service at times. He thinks that the extract of pancreas is useful, but should be used in very large quantities.

F. Lamoreux⁴ considers that **extract of liver** improves the hepatic functions and, in proper cases, produces improvement in general nutrition. In diabetes he thinks it causes distinct increase in the glycosuria and sometimes its disappearance, while evidences of insufficiency of the liver, such as urobilinuria and indicanuria, decrease, as does the excretion of urine. He states that the extract is well borne in daily doses so large as 12 gm. It is best administered by the rectum.

Jardet and Nivière⁵ consider **massage of the salivary glands** and prolonged mastication of food of value in the treatment of diabetes, since they think that chronic affections of the mouth with decreased salivary secretion are frequent causes of imperfect digestion of starches, and thus help to produce diabetes. [A theory without much basis in fact or reason, since diabetes is certainly less a disturbance of digestion than of metabolism.]

W. Murrell⁶ treated a number of cases of diabetes with **thyroid extract**. He believes that it lessened the amount of urine and the glycosuria. It decreases body-weight, and is therefore best suited to obese patients.

A. Albu⁷ found that a diabetic patient passed but little urine for several days after **riding a bicycle** for several hours, and that sugar

¹ Sem. méd., Oct. 5, 1898.

² Verhandl. d. Deutsch. Congresses f. inn. Med., 1898.

³ Sem. méd., Dec. 14, 1898.

⁴ Thèse de Paris, 1897-1898.

⁵ Rev. de Méd., Sept. 10, 1898.

⁶ Med. Brief, Feb., 1899.

⁷ Therap. Monatsh., p. 106, 1899.

reappeared after rest. After using the bicycle for several months the diabetes had changed from the severe to the mild form, but became worse again when this form of exercise was given up.

S. West¹ records the cure of a case of diabetes in a man of 47, in whose family there had been a history of diabetes, and whose urine showed a specific gravity of 1030 and contained about 8% of sugar. The treatment was **antidiabetic diet** and an acid tonic. The sugar disappeared within 3 weeks, and had not returned at the end of a year.

C. H. Bond² reports that 1 case of diabetes treated with **uranium nitrate** seemed to be cured by the drug; 3 others improved; while 5 cases of glycosuria without definite evidence of diabetes showed improvement, and 3 of them seemed to become entirely well.

A. Myer³ uses **mercuric chlorid** in treating diabetes, and insists that he has good results, due, he thinks, to its effect upon a ptomain or bacterium which he believes to be present and to be the cause of the disease. [The theory is purely speculative.]

N. E. Norway⁴ reports 2 cases of diabetes, both in males, one 23 and the other 18 years of age, in which cure was obtained by using a combination of boric acid, glycerin, arsenic, and strychnin; the chief effect was considered to be due to the **antiseptic action** in the intestine.

L. Herzog⁵ believes that the use of **alkalies in treating diabetic coma** has not given very encouraging results. In 2 cases which he reports death occurred in spite of subcutaneous injections of salt solution and sodium bicarbonate solution. One case showed distinct improvement; but this did not last. However, he believes that the subcutaneous injections should always be used at once if the patient is comatose; but it is more important to treat the cases before coma develops. Doses of 10 to 40 gm. of sodium bicarbonate per day should be given.

R. Lépine⁶ reports the **intravenous injection** of 2 liters of a solution of sodium bicarbonate, 10 gm. to the liter, in a case of diabetes in which coma seemed imminent. The injection caused the excretion of about 6 liters of urine in 24 hours, together with much improvement in the pulse and in the general condition. During the injection there was marked gallop-rhythm of the heart, which was due to too rapid introduction of fluid; this ceased when the injection was stopped.

T. Oliver⁷ describes a satisfactory result from **saline transfusion** in a case of diabetic coma; $2\frac{1}{2}$ pints were used, and the patient was freely purged at the same time. He became fully conscious, and continued in good mental condition until he left the hospital 4 weeks later. [Some striking results of saline injections have occurred in our experience; but in no case has a permanent effect been produced, nor even one as striking as that of Oliver's.]

Besson⁸ reports a case of diabetic coma in which the condition was desperate and the patient seemed practically dead. Injection of a solution of sodium bicarbonate caused return of consciousness, but death occurred the following day.

¹ Lancet, June 3, 1899.

³ Med. Rec., Dec. 10, 1898.

⁵ Berlin. klin. Woch., Apr. 3, 1899.

⁷ Lancet, Aug. 13, 1898.

² Practitioner, Sept., 1898.

⁴ Brit. Med. Jour., Dec. 17, 1898.

⁶ Lyon méd., July 3, 1898.

⁸ Gaz. hebdom. de Méd. et de Chir., Sept. 29, 1898.

DIABETES INSIPIDUS.

Strubell¹ reports his experience in **limitation of fluids** in 2 cases of diabetes insipidus, one mild and the other severe. In the mild case the abstinence from water caused severe thirst, but no dangerous general symptoms, and excretion ceased during the course of the experiment. Observation during abstinence from water could not be prolonged in the severe case because of the occurrence of dangerous symptoms. The loss of water in this case continued. These experiments therefore show that the excessive excretion of urine is not primarily due to excessive ingestion of water. This was shown also by the fact that the blood became concentrated when water was withheld. The mild case showed excessive nitrogen-metabolism; while in the severe case the nitrogen-excretion was normal.

A. Spanbock and J. Steinhaus² describe a case in a woman of 33, in which there was conjunction of **diabetes insipidus and double hemianopsia**. The woman had a history of syphilis, and antisypilitic treatment resulted in complete recovery. The authors believe that they were justified in diagnosing a syphilitic lesion in the middle of the chiasm. Eleven other cases previously reported are discussed.

Vinay³ reports 2 cases of **diabetes insipidus in pregnant women**. One of these died of pulmonary embolism 29 days after labor; while rapid tuberculosis carried off the other. He thinks the prognosis of diabetes insipidus in pregnancy should always be guarded, owing to the danger of grave complications.

Treatment.—Clowes⁴ treated a case of diabetes insipidus with **amyl hydrate** and **paraldehyd**, giving the amyl hydrate first, and using the paraldehyd subsequently to cure the woman of the habit of using the former drug, which seemed to be rapidly acquired. She had not improved upon other treatment, but as a result of this the thirst diminished greatly and she gained rapidly in weight.

RHEUMATOID ARTHRITIS.

Dengun and Schneider⁵ describe a **small diplococcus** which takes Gram's stain and which they isolated after death from the exudate in the joints of a patient who had had severe arthritis deformans. The diplococcus grew best on glucose-bouillon. Similar diplococci were found in the liver and gallbladder, and injections of cultures of the organism into the knee-joints of rabbits produced a condition resembling arthritis deformans. They consider this organism the cause of the disease. [The evidence is certainly insufficient.]

L. Badt⁶ suggests the use of **ovarian extract** in the treatment of arthritis deformans, since he thinks the disease shows some dependence upon the sexual functions, and in some instances appears to have been the result of disturbance at the time of the menopause.

¹ Deutsch. Arch. f. klin. Med., Band 62, S. 89.

² Deutsch. med. Woch., Dec. 29, 1898.

³ Gaz. hebdom. de Méd et de Chir., Nov. 24, 1898.

⁴ Boston M. and S. Jour., Sept. 3, 1898.

⁵ Münch. med. Woch., Oct. 25, 1898.

⁶ Verhandl. d. XVI. Congresses f. inn. Med., 1898.

W. Ewart¹ used **massage with small blocks of ice** over the joints affected in a case of rheumatoid arthritis and in one of pemphigus with arthritis, continuing this massage for some minutes at a time. The result was great relief. He has also used this procedure in treating the severe pleuritic pain of acute pneumonia, and suggests its use in a number of painful conditions, such as acute rheumatism and neuralgia.

Scleroderma.—F. X. Dereum² reports 2 cases of scleroderma, in 1 of which there was an interesting **association with severe rheumatoid arthritis** which had involved nearly all the joints. There were many yellow crusty patches on the skin, removal of which left a raw surface. In places the skin was pigmented and less movable than normal, and on the lower third of the leg it was tense and shining. Dereum believes that the local and general forms of scleroderma are identical, and thinks that other tissues than the skin may be involved by the process.

L. Samouilson³ believes that **disturbances of the thyroid gland** are probably active in producing scleroderma, since changes in the thyroid gland are common in this disease; hence he advises the more extensive use of thyroid medication.

Myositis.—A. Roth⁴ reviews the literature of **progressive ossifying myositis**, and then describes a case which occurred in a girl $4\frac{1}{2}$ years old. She was well nourished and fairly healthy except for the muscular trouble. This began in the upper extremities, but became general, bony deposits forming in the muscles, and the latter becoming so much contracted as to give the patient the appearance of one in tetanic spasm. The deposits of bone were all connected with the skeleton. Their formation is due chiefly to excessive activity of the periosteum, the active changes in the muscular tissue being of little importance, and the disease being really not a myositis. Heredity does not seem active in its causation; but there does seem to be a congenital tendency, as many cases occur in infancy. Traumatism seems of little importance. Of the 39 cases reported, 30 occurred in males. The internal organs remain entirely unaffected, and general metabolic processes are uninfluenced, so that patients generally retain fairly good general health. Treatment has not been of much avail, but it has been suggested that the reduction of the calcium and magnesium salts and phosphates in the diet might cause improvement by increasing elimination of these salts, and therefore absorption of the deposits. R. Crawford and H. Lockwood⁵ describe a case in a boy, $6\frac{1}{2}$ years of age. The personal and family history was without interest. The affection began in the right pectoralis major, which had become ossified and fixed to the sternum. Additional masses appeared in the dorsal region and became large, and one elbow and both shoulders were ultimately fixed. Morian⁶ describes a case of progressive ossifying myositis in a boy, $4\frac{1}{2}$ years old. He had had pneumonia accompanied by dropsy, and subsequently an attack of measles. He had also had **repeated falls**, and after one of these, in which he injured his neck, there was swelling of the neck and face and trunk, which subsided partially; but indurated areas remained in the muscles, and these became ossified and

¹ Lancet, Apr. 8, 1899.

³ Thèse de Paris, 1897-1898.

⁵ Lancet, Apr. 15, 1899.

² Jour. Nerv. and Ment. Dis., Oct., 1898.

⁴ Münch. med. Woch., Sept. 27 and Oct. 4, 1898.

⁶ Münch. med. Woch., Dec. 14, 1898.

caused marked restriction of movement. The urine was said to contain a deficient amount of calcium, but an excess of phosphoric acid. He notes that in 64% of cases of this disease examined for microdactyly this condition was found.

Nicolaysen¹ describes a case of progressive ossifying myositis which occurred in a girl, $4\frac{1}{2}$ years of age. The affection began when she was 2 years old, with stiffness in the right shoulder, which came on without definite cause and constantly increased, until later there was found practically complete ossification of the muscles of the back, the shoulders, and the nuchæ, and the scapulæ were fixed to the thorax. There were masses in the right arm and forearm, also. He reviews a total of 42 cases of this disease so far reported.

Bertelsmann² describes a case of **myositis** which occurred in a boy, 18 years of age, in whom hard nodules appeared in the muscles of his calves 7 years before the time of the report. These disappeared after massage. The nodules returned 5 years after this time, and were noticed also in the forearms. They seemed to be unquestionably in the substance of the muscle. They were painful, and as there had been injury to one of the fingers, it was thought that they might be due to infection; but when a portion of one was removed and examined microscopically, it was found to consist of somewhat altered muscular fibers, round cells, and fibrin; the use of sodium salicylate caused complete disappearance of the nodules.

A. G. Miller³ describes a **symptom of chronic or subacute myositis** of rheumatic origin which he believes has not previously been noted, and which consists of effusion into the cellular tissue over the muscle, the effusion appearing when the myositis is decreasing in intensity. It gives rise to audible crackling when the skin is moved over the muscle affected. He treats the condition by internal medication, preferably by *cimicifuga*, and by the local application of heat and the use of massage.

Intermittent Hydrarthrosis.—E. Blanc⁴ describes a case of intermittent hereditary hydrarthrosis in a woman of 26. The symptoms had been present for 7 years, and consisted of periodic swellings affecting the knees, elbows, and ankles, beginning with pains in the leg, which disappeared, but were followed by swelling of the left knee. Similar phenomena had since reappeared about every 10 days, lasting in each instance 3 days. The first day there were pain and stiffness of the joints; on the second day swelling; and on the third day the swelling increased; subsequently it diminished. Treatment had been ineffectual. The mother of the patient had had a similar affection for 30 years.

A. Bum⁵ describes a case of intermittent dropsy of the knees in a neurasthenic man. For 7 years he had had, at frequent intervals, an effusion into the right knee-joint, which lasted about a week, and then decreased to reappear again. Between the attacks the joint seemed excessively dry, and grated upon movement. In discussion, H. Schlesinger described a case that had reappeared at intervals for 6 years, coming on from March to November in every second year, the man being

¹ Norsk. Mag. Lægevid., Apr., 1899.

² Münch. med. Woch., Aug. 9, 1898.

³ Scottish M. and S. Jour., Sept., 1898.

⁴ Loire méd., Nov. 15, 1898.

⁵ Wien. med. Woch., Feb. 11, 1899.

entirely well except during this time. The attacks lasted 3 days, and there was an interval of 10 days between them. The swelling in this case was very painful and of marked degree. There were no other nervous symptoms. The treatment had been entirely without effect.

Edematous Dystrophy.—H. Meige¹ reports a number of cases that he calls **hereditary edematous dystrophy**. One occurred in a girl of 17, who had a painless swelling of the right leg, which had persisted and increased throughout 5 years, and seemed to be a dense edema. She had no organic disease. A sister had a similar condition involving both lower extremities, though she at times had some increase of the swelling, with pain and redness. The mother had had a similar swelling since her thirteenth year; and a brother, 13 years old, showed the commencement of a like process. The same condition had been observed in 2 maternal uncles, as well as in the maternal grandmother and great-grandfather. So far as known, none of these individuals had any disease to account for it. In all cases it began at about puberty.

T. S. Wilson² records a case of acute **transient general edema** which occurred in a woman of 37, following marked gastric disturbance. There was great swelling of the legs, thighs, and external genitalia, which subsequently extended to the face and arms. It was of the character of a dropsical swelling. There was no evidence of renal or cardiac disease, and the dropsy vanished very rapidly, so that it was believed to have been of urticarial nature. [The nature of cases of this sort is sometimes very obscure, and a relationship with angioneurotic edema is sometimes accepted without sufficient evidence.]

HYPERTROPHIC PULMONARY OSTEOARTHROPATHY.

W. S. Thayer³ discusses hypertrophic pulmonary osteoarthropathy and akromegaly, presenting a number of **skiagraphs** comparing the extremities of individuals with these diseases with those of normal persons. He also reports 4 cases. In akromegaly the skiagraphs showed roughness and plumpness of the bones, with a tendency to formation of tufts about the epiphyses and the points of attachment of the tendons. In osteoarthropathy the thickening is along the shaft of the long bones, and skiagraphs show a shadow running along the deeper shadow of the shaft, indicating a characteristic periostitis.

GOUT.

Etiology and Pathology.—A. Magnus-Levy⁴ has observed 36 cases of gout in Berlin in 15 months, and insists that the disease is much **more frequent than is usually recognized** by Germans, and he believes is very common in other countries. He thinks it is probable that many cases are called rheumatism, and insists that when a person more than 40 years of age acquires an acute arthritis, it is almost invariably gout if this is the first attack, for rheumatism appears only rarely after middle life. He investigated the **amount of uric acid in the blood** in 17 of his cases, using both the Garrod test and the Ludwig-

¹ Presse méd., Dec. 14, 1898.

³ Phila. Med. Jour., Nov. 5, 1898.

² Birmingham Med. Rev., June, 1899.

⁴ Zeit. f. klin. Med., Band 36, Hefte 5 u. 6.

Salkowski method, and obtained results directly contrary to Garrod's teaching of an increase of uric acid during the attacks, the amount in Magnus-Levy's cases not being larger than the amount present in the interval. In some cases the amount was greater than in normal conditions; but this is true of other diseases, his own investigations and those of others showing that this is the case in nephritis, lead-poisoning, and leukemia. The **alkalinity of the blood** was determined in 16 individuals, making estimations during the attacks and during the intervals, and as a result of the comparison of the conditions in these 2 periods he finds that the patients exhibited entirely irregular conditions. Most of the cases showed but little variation from their usual condition when investigated during the attack. **Metabolism-experiments** were done in these cases over considerable periods of time. In several of the cases there were marked nitrogen-losses, which were partly due to the lack of appetite and resulting insufficient nourishment that are usually present during the attacks; but this was not a sufficient explanation for the entire nitrogen-loss, and some of it was probably due to an intoxication. When the attack ceased most of the patients showed marked nitrogen-retention, similarly to patients recovering from such diseases as typhoid fever. The nitrogen-losses occurred only in very marked cases which commonly affected many joints, and almost all of these patients were robust individuals. Nitrogen-losses were absent or but slightly marked, if there was distinct cachexia. The nitrogen-retention in convalescents was not accompanied by a proportionate increase in weight; the tissues probably had retained water during the early part of the attack and preceding it, and this explains the relative loss of weight while there was nitrogen-retention. The absorption of nitrogen and fat was poor in most of the cases, thus indicating disturbance of the gastrointestinal tract. Uric acid was excreted in unusually large quantities during most of the attacks, though this is not true of all cases. The increase in excretion was noted in patients taking sufficient nourishment and losing no excess of nitrogen; in those whose nitrogen-balance was negative, but who were taking a normal amount of nitrogen; and also in those who were ingesting an insufficient amount of proteids. In a few instances there was retention of uric acid before the attack, but the amount retained was never sufficient to explain the symptoms of the attack or to equal the subsequent increase in the excretion. Of drugs, sodium salicylate caused some amelioration of the symptoms and produced a marked increase in the excretion of uric acid; while, on the contrary, colchicum almost invariably decreased the amount of uric acid excreted, but caused a most striking improvement in the symptoms. The absorption of xanthin-bodies from the intestine was investigated while colchicum was being given, and it was found that the absorption was about normal, so that this was not the cause of the reduction in their excretion. Investigations of respiratory exchange were undertaken in several cases, and the figures obtained were about normal. The result of all this work and the criticism of the work of others lead to the conclusion that we do not know the ultimate cause of gout, but we do know that there is no proof of the correctness of the older theories.

E. Schmoll¹ believes that gout is the result of the **retention of the**

¹ Centralbl. f. innere Med., Oct. 22, 1898.

products of nitrogen-metabolism. He thinks that they produce the necrotic areas present in this disease, and that these localized necroses then produce the excess of uric acid through the destruction of cells. Nitrogen-retention during the attack frequently has been proved to be present.

G. Mordhorst¹ has studied the **influence of temperature** upon the formation and solution of the spheres of urates. He finds that precipitation of these spheres is proportionately less the warmer the solution, and with increase in temperature more neutral salts must be added to cause their deposition. If a warm acid solution containing uric acid in a quantity insufficient to saturate it be exposed to a lower temperature, some precipitation soon occurs; while if this has already occurred, exposure to a higher temperature will cause their solution. Cooling of the skin may produce rheumatism, which he believes results from precipitation of these urate-spheres in the connective tissues and their accumulation in the lymph-spaces. This occludes radicals and gives rise to pain and local disturbance of the circulation. By the increase in body-temperature which occurs from fever, hot baths, or bodily exertion, the swellings and pains are reduced, because some solution of these spheres takes place again. They are partially dissolved and carried to the capillaries, where they are arrested, and, causing some stasis, give rise to increased blood-pressure and to other disturbances, particularly headache. The difference between the alkalinity of the blood and that of the lymph is so variable that the changes in the alkalinity of the lymph, even when completely within the normal range, can cause the deposition of these spheres and thus produce gout.

C. Watson² investigated the blood of birds and snakes, and also numerous viscera of birds, snakes, and several mammals, in order to determine the amount of uric acid present. The amount was found to be greater in the liver and spleen than in the other organs, while the kidney contained less; uric acid was always found in the blood of birds. He could draw no definite conclusion from this work as to the seat of the formation of uric acid, but decides that, since uric acid is present in the blood of birds, there is no support for the theory of Garrod and Luff that it is formed chiefly in the kidneys.

Symptomatology.—F. P. Atkinson³ describes the case of a man with gout, who repeatedly exhibited **Cheyne-Stokes respiration**, these attacks of irregular respiration seeming to vary according to the amount of urate deposit in his urine; with improvement in the gouty condition the Cheyne-Stokes respiration disappeared permanently. It was believed to be due to the high arterial tension.

C. R. Elgood⁴ describes what he terms a **fatal case of lithemic poisoning**. The patient was a man of 69, who had been subject to attacks characterized by marked irritability and restlessness, with great itching of the skin and severe dyspnea. During these attacks the stomach was usually exceedingly unretentive, and while they continued the urine contained large amounts of urates. They were always followed by prostration and weakness of the heart, and recovery was slow. In 2 attacks there had been thrombosis of veins. He had no heart-lesion

¹ Centralbl. f. innere Med., July 9, 1898.

² Brit. Med. Jour., Jan. 28, 1899.

³ Ibid., May 18, 1899.

⁴ Lancet, Feb. 18, 1899.

except some dilatation, but the vessels were distinctly atheromatous and the liver enlarged. In his fatal attack the symptoms continued and grew worse; Cheyne-Stokes breathing appeared; he passed into lethargy, finally became unconscious, and died in coma. There was no sign of nephritis; but during the last attack the urine was much more diminished than usual, and the author suggests that the result was due to ultimate failure of the kidneys to secrete the poisons that brought on the attacks.

J. Mickle¹ emphasizes the importance of the consideration of a **gouty tendency** in the issuance of a **life-insurance** policy. He believes that the premium should be made even higher in such subjects, unless they are already of advanced years. In all subjects the gouty tendency has less effect in shortening lives. He presents a statistical study of gouty policy-holders, and shows that the period of life was shortened in general about 5 years below that to be expected. A further study showed that gout is most frequent in individuals who drink alcoholic beverages of poor quality.

Treatment.—W. Bain,² in investigating the effects of **various mineral waters** to see whether it is true that those containing the smallest percentage of sodium salts are most beneficial in treating gout, decides that the various waters tested, in spite of their containing varying quantities of these salts, had only minute differences in their solvent power upon sodium biurate. He thinks that laboratory-tests cannot be considered decisive, and that the result of therapeutic experience alone will determine the value of any mineral water in gout.

E. Lindemann³ describes an **electric apparatus** which he uses for the production of **hot air** in the treatment of joint-affections. He recommends it because it is readily managed and there is no danger of fire or of burning the skin, and during its use the limb may be moved about.

A. S. Myrtle⁴ has used **electric heat-generators** in treating arthritis with the hot-air bath, raising the temperature from 300° to 360° F., and continuing the bath for 40 to 45 minutes. His results seem to have been extremely satisfactory.

A. P. Luff⁵ has had good results from the treatment of gout, rheumatism, and rheumatoid arthritis by the celebrated electrothermic generator. He considers it most useful in gout. Its method of action is unknown, but he believes it possible that it causes local activity in metabolism; perhaps the electricity may have some effect.

A. G. Reed⁶ is a strong advocate of the hot-air apparatus in the treatment of numerous conditions. He has managed a large number of cases by this method, and obtained improvement in all, and in many complete recovery. Various diseases were treated, among them chlorosis and other forms of anemia; asthma, angina pectoris, rheumatoid arthritis, gout, skin-diseases, and even acute pleurisy.

J. T. Schell⁷ states that a patient of 62, after repeated use of hot-air baths, developed nephritis with quite severe symptoms. Involvement of the kidneys he attributes to the extra work thrown upon them as a result

¹ Brit. Med. Jour., Sept. 17, 1898.

² Ibid., June 10, 1899.

³ Münch. med. Woch., Nov. 15, 1898.

⁴ Brit. Med. Jour., Dec. 10, 1898.

⁵ Practitioner, Feb., 1898.

⁶ N. Y. Med. Jour., Sept. 17, 1898.

⁷ Phila. Med. Jour., Dec. 31, 1898.

of "the great chemie changes incident to exposure of part of the body to high degrees of heat." [Frazier's careful work failed to demonstrate any increase of nitrogen-metabolism under the use of the hot-air baths, and the explanation of the nephritis given here is speculative.]

H. L. Jones¹ describes the treatment by **electric-light baths**. This is believed to induce perspiration more quickly than ordinary hot-air baths, the heat is thought to penetrate more deeply, and other advantages are mentioned; the baths are considered especially suitable for rheumatic and gouty conditions. Margaret Cleaves² discusses the use of electric-light baths, particularly in chronic bronchitis, asthma, and phthisis, and claims valuable results and an almost immediate good effect. In some cases she found an increase in the hemoglobin and red blood-corpuses.

D. Graham³ reports a case of gout with marked deposits of urates, in which rapid improvement was obtained from the use of general **massage, local massage** of the joints affected, and the application of the negative pole of a galvanic current.

F. W. Tunnicliffe and O. Rosenheim⁴ have studied the value of **piperidin** as a solvent of uric acid. They decide that the tartrate of this substance may be given safely in doses of 15 gr. 3 times a day. They believe that it is preferable to any drug yet known for the treatment of uric acid, gravel, and gout; it is cheap, and in this respect has the advantage of many other substances. Their experiments showed that this substance and lysidin, piperazin, and urotropin reduce the total amount of uric acid excreted, but not the amount of nitrogen; therefore they probably act by rendering metabolic processes more complete.

Barnes,⁵ in discussing the treatment of lithemia, states that the indications are to **encourage elimination** and to **avoid nitrogenous foods**, from which the toxic agents are derived. He does not prohibit nitrogenous food absolutely, since some is necessary in metabolism, but believes that the meat should be stewed to deprive it of its extractives. He has not found the salicylates valuable in lithemia. They do not increase elimination to any marked degree, and do cause increase in the number of leucocytes; and the latter is likely to cause increase in the amount of the alloxuric bodies.

J. L. Heffron⁶ discusses the treatment of the **uric-acid diathesis**. This is dependent largely upon the use of proper diet, exercise, and daily baths. He advises the restriction of meat in all cases, excepting in anemic individuals, and recommends the use of sugar as far as possible without disturbing the digestion. Meat-extracts are to be excluded, as they contain such a large proportion of nitrogenous waste.

J. Weiss⁷ advises the use of **chinic acid** in the treatment of the uric-acid diathesis, since it causes elimination of large amounts of uric acid combined as hippuric acid. It is, in his belief, best given as a lithium salt, in order to get the diuretic effect of the lithium. The dose advised is 0.5 gm. of chinic acid, 5 to 10 times a day, in tablet-form, dissolved in considerable water.

¹ Brit. Med. Jour., Mar. 18, 1899.

² N. Y. Med. Jour., Jan. 28 and Feb. 4, 1899.

³ Boston M. and S. Jour., June 1, 1899.

⁴ Brit. Med. Jour., July 25, 1898.

⁵ Med. Rec., Mar. 26, 1898.

⁶ Med. News, July 2, 1898.

⁷ Berlin. klin. Woch., Apr. 3, 1899.

OBESITY.

W. Ebstein,¹ in discussing the relation between obesity, gout, and diabetes, states his conviction that all 3 diseases are **constitutional** affections and are **frequently hereditary**. He thinks they are all probably general disturbances of protoplasmic activity, and that all may be transmitted through heredity. In gout there is evidence of disturbance of cell-activity in an excessive excretion of uric acid, which comes from the nuclei; the presence of glycogen in tissues in which it is not normally present is evidence of similar cell-disturbance in diabetes; and the absence of evidence of diminution in respiratory activity is negative evidence of disturbance of cell-activity in obesity.

N. Schiöde² carried out a series of nitrogen-metabolism experiments over a period of $3\frac{1}{2}$ months in order to determine the **effect of thyroïdin** upon the nitrogen-metabolism, and the possibility, when using this substance for the treatment of obesity, of controlling the nitrogen-loss by administering large amounts of proteids in the food. As a result, he reaches the conclusion that this preparation causes a considerable decrease in body-weight. This is, to a certain extent, due to the loss of proteids; but since this is limited and may be controlled, and the loss of water is slight, if it exists at all, he decides that the chief loss must be due to a destruction of fats. He found it possible to control the proteid-loss, and even to cause a positive nitrogen-balance, by giving large quantities of proteids. The effect of thyroïdin upon the temperature was not marked, though it caused irregularities slightly greater than normal. The pulse was increased in frequency, sometimes to a marked degree; the general condition of the patient, when doses of considerable size were given, was unsatisfactory. He decides that this preparation may be used in the treatment of obesity if large amounts of proteids are given; but since collapse, sometimes coming on suddenly, has been noticed repeatedly when using thyroid preparations, small doses only are admissible; and they must be carefully watched and the preparation withdrawn at once if unfavorable symptoms appear.

Conche³ describes 2 cases of **thyroid poisoning** resulting from the use of thyroid for obesity. The second was interesting. After 6 weeks' treatment he had abdominal pain, diarrhea, oliguria, and subsequently generalized swelling of the lymphatic glands. His memory failed; he became somnolent, grew progressively weaker, and complained of coldness. The symptoms lasted for 9 or 10 months, and during the latter portion of the time there was severe furunculosis. The author considers the symptoms due to intoxication by an impure preparation.

Ebstein⁴ decides that the use of thyroid gland or preparations made from this gland in the treatment of obesity should not be encouraged, because the thyroid preparations are uncertain in their effects and unreliable, and because the object in treating obesity is to reduce the amount of fat while preserving, so far as possible, the proteids of the body. This, thyroid does not do, but causes a very marked **proteid-destruction**.

¹ Deutsch. med. Woch., Nov. 3, 1898.

² Arch. f. Verdauungs Krankh., Band 5, Heft 1.

³ Lyon méd., Aug. 14, 1898.

⁴ Deutsch. med. Woch., Jan. 5 and 12, 1898.

tion. Ebstein believes that other methods are quite as effective if properly used, and that they are much safer.

M. Weiss,¹ on purely clinical grounds, decides that the treatment of obesity with thyroid extract is entirely satisfactory, and is followed by no unpleasant effects. He reports 1 case of obesity complicated by cardiac insufficiency in which marked improvement in the heart-affection followed upon decrease of fat through the use of the thyroid extract.

W. MacLennan² records 3 cases of obesity in which he used a preparation that he calls **thyroglandin**. This was given first in a dose of 1 gr., and finally increased until 9 gr. were taken in a day. Weight was lost rapidly, and there was none of the unpleasant symptoms so commonly noted from the use of ordinary preparations. He also records a case of myxedema first treated with thyroid gland, and showing some improvement. Afterward thyroglandin was used, 16 gr. 3 times a day, and the improvement was quite as noticeable as when the raw gland was used, and there were no unpleasant symptoms. The substance is prepared in such a manner that it is thoroughly sterilized, and the deleterious substances are believed to be entirely excluded.

M. Roth³ records investigations of the effect of the **electric-light bath** in the treatment of obesity, and decides that it has no more effect than other sweat-baths.

MYXEDEMA AND DISEASES OF THE THYROID GLAND.

J. R. Connal⁴ describes a case of myxedema which appeared after the use of potassium iodid and the production of iodism. The puffiness of the face resulting from the use of the iodid persisted, and there was a progressive development of myxedema, so that Connal thought the affection might have been in its incipency and its progress accelerated by the use of the iodid.

A. Jolly⁵ describes a case in which there were symptoms of **both mxyedema and exophthalmic goiter**; the skin was thick, the thyroid gland atrophied, and the hair was lost freely; but on the other hand the pulse was rapid, and there were dyspnea, projection of the eyeballs, and sweating. The patient was a woman of 26.

W. Osler⁶ describes a case in which there was an acute myxedematous condition with tachycardia, glycosuria, melena, mania, and finally death. The patient was a man of 31, who had been of good habits, but was an excessively hard worker. His first symptom was increase in size, with a peculiar bloated appearance. Subsequently he became increasingly weaker and had delusions. The eyes were slightly prominent, but there was no Graefe's sign. The thyroid was not enlarged; possibly, it was diminished. The skin was dry and somewhat purplish in color. In the last few days of life, during the administration of thyroid extract, the weight decreased rapidly; but tachycardia became pronounced, he became delirious and excited, glycosuria appeared, and he died of exhaustion. Osler says that it seems probable that the case was due to pervers-

¹ Wien. med. Woch., Oct. 8, 1898.

² Brit. Med. Jour., July 8, 1898.

³ Wien. med. Woch., May 6 and 13, 1899.

⁴ Glasgow Med. Jour., Oct., 1898.

⁵ Jour. Am. Med. Assoc., Apr. 15, 1899.

⁶ Jour. Nerv. and Ment. Dis., Feb., 1899.

sion of the thyroid function resulting in a toxemia, presenting some of the features of Graves's disease and some of those of myxedema.

B. Bramwell¹ describes a case of typical **cretinism** in a woman of 36, which was interesting owing to the fact that menstruation began when she was 25, and had continued up to the time of the report, though she had been a cretin since her third year.

S. Kuh² reports 2 cases of myxedema, in both of which the thyroid glands were apparently atrophic. In one case he used dried **thyroid**, and in the other **iodothylin**. The latter preparation caused no disturbance of the stomach or other disagreeable effects; while its effects upon the myxedema were quite as satisfactory as those from the dried thyroid.

G. R. Murray³ describes, apparently without firm basis, since there was no opportunity for postmortem examination, 4 cases of a condition which he terms **early thyroid fibrosis**. The patients had a somewhat deceptive appearance of health, owing to a flush of the cheeks; but the skin was yellow, the face heavy and broad, the subcutaneous tissue slightly thickened, the skin dry and rather scaly, and the hair sometimes fell out. The patients were languid and readily became fatigued. They improved upon thyroid treatment, and this seems the chief support for the name given to the condition.

D. McKenzie⁴ reports his observations upon **goiter** in and about the town of Larkhall, Scotland. He observed goiters large enough to attract attention in 25% of the population, and slighter instances were seen in a much greater percentage. Almost all of them occurred in the mining and laboring classes. Marsh attributes endemic goiter to infection, supporting this view by stating that the disease occurs within well-demarcated areas; that it disappears entirely after the introduction of proper drainage; and that the water from certain wells produces goiter in those who drink it, but becomes harmless after being boiled. The surface-wells in Larkhall seem to produce goiter, but its general endemic appearance cannot be attributed to the water-supply, since it is the same as that of a nearby town in which goiter is not known.

N. Pitt⁵ describes a case which occurred in a boy, in whom there were profound cyanosis, orthopnea, puffiness of the face, and marked distention of the thoracic veins, together with great **enlargement of the thyroid**. The symptoms terminated most curiously and suddenly by an attack of severe collapse, followed by sudden disappearance of all the previous symptoms, so that within a few hours almost all pressure-signs had disappeared, and within a few days entire recovery had occurred. It is thought the pressure-symptoms were due to a caseous gland that had ruptured into the esophagus.

H. Hellendall⁶ reports a case of **struma maligna** which was interesting from the character of the growth and its extent, and because of the occurrence of severe bleeding from the esophagus, the hemorrhage being due to rupture of varices which were the result of the pressure of the tumor. The subject of the disease was a woman, 58 years old. She presented a tumor which reached from the larynx to the xiphoid process.

¹ Lancet, Sept. 10, 1898.

³ Brit. Med. Jour., Oct. 1, 1898.

⁵ Practitioner, Nov., 1898.

² Phila. Med. Jour., Apr. 8, 1899.

⁴ Glasgow Med. Jour., Jan., 1899.

⁶ Deutsch. med. Woch., Apr. 6, 1899.

After death it was found that almost the whole sternum was eroded, as was part of the left first rib; both jugular veins were thrombosed, and there were numerous varices having the unusual situation of the upper two-thirds of the esophagus. The microscopic character of the tumor was very unusual, and Hellendall believes unique, for it was evidently malignant in its whole extent, judging from the clinical course of the growth, while the greater part of the tumor showed microscopically neither carcinomatous nor sarcomatous structure. This is often the case with struma maligna, but at the edges the tissue of this growth was evidently carcinomatous; it therefore seemed to be a combination of struma maligna and carcinoma.

DISEASES OF THE BLOOD.

CONDITIONS AFFECTING THE CONSTITUTION OF THE BLOOD.

H. Schwinge¹ gives a study of the variations in the amount of hemoglobin and of the blood-corpuscles at **various periods of life**, based upon a considerable amount of personal work and a study of the work of others. The red corpuscles are greatest in amount directly after birth. They decrease for the first year decidedly, but then increase fairly regularly to a point between the thirtieth and fiftieth years, when there is again some decrease. The leukocytes decrease during the active period of growth, but increase again in the latter part of life. Females, between puberty and the menopause, show smaller blood-counts and less hemoglobin; while after the climacteric the conditions in the two sexes are practically the same. The explanation of the lesser amount of red cells and hemoglobin in females is difficult; but the cause is very probably found in the fact that they take proportionately less food. Another cause is the loss of blood in menstruation. Pregnancy does not seem to cause anemia; but lactation does. Variations in the relative concentration of the body-fluids and of the blood are certainly the most important causes of the changes in the amount of blood in the 2 sexes at different periods. This is most strikingly seen in the concentration of the blood in the newborn during the rapid loss of water, through evaporation, directly after the establishment of respiration.

J. Luxenburg² contributes a study of the blood in 40 cases of **functional neuroses** (hysteria and neurasthenia). None of the cases showed any evidence of organic disease. His results show that in spite of the commonly accepted existence of a hydremia, such is not present. The watery content of the blood is normal. The red cells are often increased up to 6,000,000 or 7,000,000, and this is probably the result of vasomotor instability. Leukocytes are frequently notably decreased. The results of sedimentation were very variable, chiefly in the time required for sedimentation. The variations are probably due to differences in the amount of fibrin in the blood.

A. Constantin³ divides **polycythemia** into a **relative** and a **true form**. Relative polycythemia is readily produced by abstraction of

¹ Pflüger's Archiv, Band 73, Hefte 7 u. 8.

² Centralbl. f. innere Med., May 27, 1899.

³ Thèse de Paris, 1897-1898.

water in any way ; either through increase in normal secretions or through the tapping of abdominal and similar exudates. He believes, however, that the true form is frequent, and notes the polycythemia of dyspnea as an instance of this.

J. S. Billings¹ describes 5 cases of profound anemia in which nucleated red blood-corpuscles were absent. He stated that these are the only cases he has observed in which reduction of the red corpuscles to below 1,500,000 was not accompanied by the appearance of nucleated red cells ; and he thinks that the absence of such cells is an evidence of **lack of regenerating power** of the bone-marrow, and that therefore the prognosis in such cases is grave.

H. Dominici² found that **experimental septicemia** caused nucleated red blood-cells to appear in the bone-marrow of the animals. In examining the bone-marrow of human beings who had had septic infections he found in them also, besides myeloplques and many large mononuclear cells, a number of red corpuscles which showed single nuclei. He has found, too, that while their occurrence is rare, nucleated corpuscles do appear at times in the circulating blood in cases of septicemia.

Dansac³ believes that there is an especial affection of the blood which is likely to come on about puberty, or to be aggravated at puberty ; which is frequently accompanied by fever and swelling of the lymphatic glands, particularly those of the mouth and pharynx ; and which shows the presence of the fetal form of red corpuscles and of nucleated red cells in the lymphatic tissues alone, and not in the general circulation. Dansac calls this condition **erythrocytosis**.

Determann⁴ has studied the **origin of the blood-platelets**. He considers the most satisfactory means of preserving them for studying and counting in the fresh blood is by Bizzozero's fluid. His device for determining their number was to prevent the running together of the platelets by pricking the finger, placing a drop of the preserving fluid over the incision, and allowing the blood to flow into it. The cover-glass of the Thoma-Zeiss counter was then touched to this mixture lying on the finger, and the drop on the cover thoroughly mixed. It was then inverted over the counting cell, and the platelets and red blood-corpuscles counted, and the ratio of platelets to red cells thus determined. The number of red cells was learned from a separate count, and the actual number of platelets per cmm. was then readily determined. The ratio of platelets to red corpuscles in normal individuals averaged 1 : 22, varying between 1 : 18 and 1 : 30. In certain chronic diseases they are found increased in proportion to the reds, sometimes to as great a ratio as 1 : 1. In a case of arthritis deformans the ratio was as 2 : 1, and in one of myelitis they exceeded the reds in the proportion of 4 : 1. Determann agrees with Arnold that the platelets come from the red blood-corpuscles. He studied them by filling small, sealed glass tubes with blood, the top of the tube being broken off just before filling it, and the blood thus flowing into a partial vacuum. The tube was then resealed and kept at 37° C., and examined at intervals. The specimens were afterward examined microscopically by Arnold's method of impregnating thin skins of elder-

¹ N. Y. Med. Jour., May 20, 1899.

² Compt. rend. de la Soc. de Biol., Nov. 19, 1898.

³ Thèse de Paris, 1897-1898.

⁴ Deutsch. Arch. f. klin. Med., Band 61, Heft 4.

pith with the blood, applying a cover-glass, and sealing with vaselin. Determann found that after 24 hours buds appeared on the red blood-corpuscles, at first attached to protoplasmic processes, and containing hemoglobin; but later they became separated and lost the hemoglobin, and had the usual appearance of blood-platelets. The budding was seen to be more marked in a number of cases of anemia, among which were instances of chlorosis. Determann considers the number of blood-platelets present in the blood an index of the resisting-power of the blood-cells at the time, and holds that they are of prognostic value as an indication of the vitality of the red blood-cells.

S. Jellinek¹ made comparative studies of the **amount of coloring-matter and of iron** in the blood, using for the former Jolles's ferrimeter; for the latter, Fleischl's hemoglobinometer. The results varied so considerably that he reached the conclusion that the hemoglobinometer could not be depended upon for indicating the amount of iron in the blood. Improvement in the amount of iron in chlorosis was shown much more rapidly by the ferrimeter than by the hemoglobinometer. Incidentally, he notes that the treatment of such cases with organic preparations caused but little evidence of improvement in the blood. The combined method of examining the blood with these 2 instruments was very satisfactory, and he thinks that Jolles's instrument is suited to clinical purposes and should be used.

R. C. Cabot and P. S. Mertins² have investigated Justus's **blood-reaction for syphilis**; *i. e.*, the marked transient reduction of the hemoglobin after administering mercury hypodermically or by inunction. A reduction of from 10% to 35% was shown by actively syphilitic cases, while 3 with a previous history of syphilis gave no reaction; 33 tests in nonsyphilitics were negative, with the exception of 1 case of chlorosis. They consider the test valuable in diagnosis.

C. Delezene,³ in studying the action of certain **anticoagulant bodies**, found that the delay in coagulation was to be attributed to both the diminution in the number of leukocytes and to the action of the liver. If the liver was isolated and washed with salt solution, it was found that if serum containing some eel-serum was run through the liver-vessels it coagulated only after several days; while under other circumstances the eel-serum caused ordinary blood-serum to coagulate rapidly. Similar retardation of coagulation was seen when serum containing diastase, toxins, or peptone solutions was run through the liver. The nature of the action of the liver was not determined.

Muir,⁴ in discussing **leukocytosis**, applied the term to either local or general increase of the white cells. He thinks that there is active production of leukocytes, and adheres to the chemotactic origin of leukocytosis, considering that the leukocytes are chiefly derived from the bone-marrow.

S. Klein⁵ observed some years ago a case which he considered of extreme importance in the consideration of the **origin of the eosinophiles**. It occurred in a man, 63 years old, who had been operated upon for hemorrhoids, and subsequently developed a hemorrhagic exudate in the right pleura, and died after a few weeks' illness, probably of sepsis.

¹ Wien. klin. Woch., Aug. 18-25, 1898.

² Boston M. and S. Jour., Apr. 6, 1899.

³ Nouv. Montpellier méd., Nos. 31-34, 1898.

⁴ Brit. Med. Jour., Sept. 3, 1898.

⁵ Centralbl. f. innere Med., Jan. 28 and Feb. 4, 1899.

In the early part of this illness, beside reduction of the red corpuscles and hemoglobin, it was found that he had over 12% of eosinophiles in his blood, and that the exudate in the pleura contained 74.4% of eosinophiles. Two weeks later it was found that while the eosinophiles in the exudate had increased only 2%, the number in the blood had reached 40% of the leukocytes. Two cases reported by Harmsen are then abstracted at length, since they also show the same increase of eosinophiles in bloody exudates, followed by increase of the number in the blood. These cases have convinced Klein that the eosinophiles occur in diseased tissues not as the result of any specific irritation, but as the **result of extravasation of blood or of hemoglobin**. He believes that the eosinophiles are not new forms of cells, but are neutrophiles which have taken hemoglobin or red corpuscles into their bodies, and have thus altered their neutrophile granulations into eosinophile. He therefore believes that the eosinophiles are produced locally in the tissues in any situation in which extravasation of blood may occur, and that eosinophilia is not a pathologic condition of itself, but is simply a result of a function exercised by the leukocytes in absorbing extravasated blood; and he believes also that eosinophilia has no other diagnostic value than to indicate that blood-extravasation is going on in the tissues.

E. Fuchs¹ believes, from his study of the eosinophile granulations, that they can arise from altered red blood-cells, the latter being taken up by certain leukocytes. He has found large numbers of eosinophile-cells in hemorrhagic sputum, when before the hemorrhage occurred the sputum contained but few. He has found them in large numbers in tuberculous pleurisy and peritonitis, the exudates in these affections being, of course, frequently hemorrhagic. He has known them frequently to be decreased in many acute and chronic febrile diseases, such as typhoid fever, rheumatism, sepsis, pneumonia, and meningitis, and considers this the result of the action of the toxin upon the leukocytes. He does not consider their presence in large numbers in the sputum of tuberculous subjects of any prognostic value.

J. Pitrowski and K. Zaleski,² together with a useful review of the most important Polish **literature upon eosinophilia**, severely criticise Klein's article. They consider his statement against Ehrlich's theory mere negation without proof; and, in contradiction of Klein's views, direct attention to the fact that, if they were true, eosinophilia should occur in all cases in which there is internal hemorrhage, such as contusions, fractures, infarcts, lobar pneumonia; and eosinophiles should not be present in such large numbers in diseases such as asthma, in which hemorrhages are at most extremely slight in amount.

Bettmann³ found large numbers of **eosinophile-cells in blisters** produced by cantharides. They were present in especially large numbers when eosinophilia existed in the blood. He believes their presence in the blisters is due to some chemotactic stimulus.

Schreiber and Zaudy⁴ investigated the **relation between** the excretion of **uric acid** and the number of **leukocytes** when salicylates

¹ Centralbl. f. innere Med., May 20, 1899.

² Ibid., June 3, 1899.

³ Münch. med. Woch., Sept. 27, 1898.

⁴ Deutsch. Arch. f. klin. Med., Band 62, Hefte 3 u. 4.

were given and when they were withheld. They found that the uric acid increased to a moderate degree when sodium salicylate was given, even when alkaline mineral water had been given before. The leukocytes were increased by sodium salicylate, and the uric acid always showed the usual relation to the number of leukocytes, increasing very markedly at the time that the leukocytes showed rapid diminution, when the number had previously been very large, the increase in uric acid therefore corresponding to the destruction of the leukocytes. The system seemed to accommodate itself soon to the use of the salicylate, both as regards the leukocytes and the uric acid, the leukocytosis decreasing and the uric acid disappearing after the first few days' use of the drug. There are also records of the xanthin-bases during this time, but they show nothing in especial [and the determinations are untrustworthy, since they were done by the Malfatti method].

Bohland¹ made further investigations as the result of his discovery that some drugs increase the leukocytes or decrease their number. These investigations had special reference to the coincident effect of such drugs upon uric acid. Tannic acid diminished both the uric-acid excretion and the number of leukocytes, and digestion-leukocytosis did not occur after it was administered. Ergot diminished both, but the fall in uric acid occurred much earlier than that in the number of leukocytes. Atropin reduced both in equal degree. Camphoric acid reduced the leukocytes, but had no influence upon the uric acid. From these results he decides that Horbaczewski is wrong in teaching that nuclein comes exclusively from the leukocytes. The increase in uric acid may be attributed to a destruction of leukocytes when these are largely increased, as in leukemia and in pneumonia; but when there is little or no leukocytosis this would hardly hold. Bohland further found that giving tannic acid with thymus kept the uric-acid elimination about normal. Certain drugs, therefore, seem to restrain the formation of uric acid; and they may cause the production of more alloxur-bases, or they perhaps cause further oxidation of the uric acid to allantoin or urea. It seems possible, therefore, to control uric-acid formation in gout; and whether one believes that this disease is dependent upon excess of uric acid or not, it is desirable to decrease the amount of uric acid to prevent deposits in the joints and the formation of calculi.

M. Scirru² has studied the relation between leukocytosis and the amount of uric acid, and found that there was no definite parallelism between them. He believes that the uric acid is not derived in great part from the spleen, but chiefly from the lymphoid tissues. He found that injection of ergotin decreases the excretion of uric acid and the number of leukocytes, and that a marked decrease of uric acid occurred when the diet was composed chiefly of milk.

C. E. Simon³ discusses the **perinuclear basophilic granules** of the leukocytes described by Neusser as characteristic of the uric-acid diathesis. Simon finds that they are constantly present in health, however, and considers their absence pathologic. They are almost always present in disease, but not more abundant in lithemic conditions, rheumatism, or neurasthenia than in other affections. In cases of malignant

¹ Münch. med. Woch., Apr. 18, 1899.

² Il Policlinico, Feb., 1899.

³ Am. Jour. Med. Sci., Feb., 1899.

disease they were often found present in but small numbers, but their absence was not pathognomonic of malignant disease. Their relation to the excretion of uric acid and xanthin-bases was determined, and it was found that this was inconstant.

P. Borissoff¹ investigated the correctness of the terms neutrophile and amphophile as applying to **granulations of the leukocytes**. He uses numerous basic and acid dyes in mixtures, and reached the decision that the neutrophiles are really oxyphiles, and that the triacid mixture is really an acid stain. The amphophiles are always stained by acid dyes, often in a mixture of acids and alkalies, and are therefore oxyphiles, also. Borissoff believes that the protoplasm and its granulations are always basic.

T. L. Chadbourne² has examined 21 cases directly before, during, and immediately after **etherization**, in order to determine the **effect upon the number of leukocytes**. Digestion-leukocytosis was excluded. All the cases showed marked leukocytosis. The increase varied from 6% to 73%, the average being 37.3%. Counts made when the ether had been given about 15 minutes showed the greatest increase; in other words, the causes producing it are more active in the beginning. The leukocytes diminished much on the day following, and the count was generally normal within 2 days. The numbers of the various forms of white cells showed no notable change.

F. G. Burrows³ gives an elaborate study of the **blood** of 8 cases in which **convulsions** occurred. In all of these he found during the convulsions a decided leukocytosis. The nature of the cases was various, including senile and terminal dementia, senile confusion, general paralysis, katatonia, and puerperal eclampsia. The degree of leukocytosis, in a general way, seemed related to the severity of the convulsive attack. It persisted from 3 to 15 hours after the convulsion. The leukocytosis was of the inflammatory type, the polymorphonuclear elements being increased in direct proportion to the severity of the attack; the lymphocytes being usually absolutely diminished. Some myelocytes were commonly found, their number being notable in the cases which showed prolonged grave convulsions. The leukocytosis could not be wholly explained through the muscular work performed in a convulsion. In 1 case that had convulsions for 6 days over 100 attacks occurred, showing a leukocytosis as marked as 43,000. The leukocyte-count varied at intervals almost directly with the number of convulsions occurring at about the time of the count. [Some of the leukocytosis, but probably not all, even when it was of slight degree, may have been the result of peripheral degeneration, which is shown to have been present by the high counts for the red cells. If leukocytosis occurs regularly after convulsions, it may prove of some value in the discovery of nocturnal epilepsy.]

A. V. Decastelle,⁴ in studying the effect of **changes in blood-pressure** and in the lumen of the bloodvessels on the **leukocytes**, found that stimulation of sensory nerves diminishes the number of leukocytes in the general circulation by causing reflex contraction of abdominal vessels, and thus retention of leukocytes in them. Stimulation of the

¹ Gaz. hebdom. de Méd. et de Chir., Sept. 15, 1898.

² Phila. Med. Jour., Feb. 18, 1899.

³ Am. Jour. Med. Sci., May, 1899.

⁴ Wien. klin. Woch., Apr. 13, 1899.

vasoconstrictors in any circumscribed area causes diminution of the leukocytes in the blood coming from that area, and the same results in shock from the same cause. Reduction of blood-pressure causes transient diminution of the leukocytes. Dilatation of the vessels has no definite effect upon the number of leukocytes. The injection of substances causing a hypoleukocytosis results in a collection of the leukocytes in the capillaries of the lungs. The cause of this is not well determined.

De Renzi and Boëri¹ have examined the blood after the use of numerous **purgatives** in animals, and discovered the presence of **hyperleukocytosis** in practically all instances. The leukocytosis bore no direct relation to the severity of the diarrhea produced, but was attributable to the degree of irritation of the mucous membrane of the intestine, being thus analogous to digestion-leukocytosis. The leukocytosis produced in this way seemed to have no influence upon experimental infection.

H. M. King,² in studying the conditions of the blood in **diseases of the abdomen and pelvis**, found that, contrary to the teaching of others, there was nothing distinguishing such conditions from sepsis elsewhere. In the milder forms there was slight leukocytosis. In the grave, fulminating forms leukocytosis commonly did not develop; but if the case became more protracted, it was seen, together with severe anemia; decrease of the leukocytosis without general improvement was a bad omen; while increase of leukocytosis without increase of the general symptoms usually indicated local extension of the suppuration without general infection.

J. M. Krausmann³ produced **experimental leukocytosis** by injections of spermin and protalbumose. Hyperleukocytosis was produced more readily after the injection of spermin. He found that the increase of leukocytes had a markedly **defensive action** in rabbits infected with germs of anthrax, cholera, or pneumonia, infection being least severe when carried out at the maximum period of increase of leukocytes; while it was most dangerous at the period of decrease of leukocytes. Animals fatally infected with cholera or pneumonia showed a progressively increasing hypoleukocytosis. Those severely infected, but about to recover, showed hyperleukocytosis succeeding a decrease.

Besredka⁴ has studied the role of the **leukocytes in experimental poisoning** with arsenic trisulphate, which substance occurs in yellow granules, and therefore is readily seen. It was found that after its administration the leukocytes contained these granules; and leukocytes so loaded with poison-granules rapidly increased in number in case the animals were about to recover; while in fatal cases the leukocytes gradually decreased until death occurred. The injection of carmin into the peritoneal cavity showed that the leukocytes took up this substance first; and if it were present in sufficient amount, they apparently became so loaded with it that they could not absorb the arsenic, and doses that were otherwise not fatal became so under these circumstances. The large mononuclear cells were chiefly active in absorbing the arsenic. The granules gradually disappeared from the leukocytes, and it seemed probable that the arsenic had been converted into a less toxic or inactive substance through the action of the leukocytes, and was then dissolved out and ex-

¹ *Gaz. degli Ospedali*, Dec. 11, 1898.

² *Med. Rec.*, Oct. 8, 1898.

³ *Thèse de St. Pétersbourg*, 1898.

⁴ *Ann. de l'Inst. Pasteur*, XIII., 1899.

erected. The author uses these results to support the theory of phagocytosis.

K. Bohland¹ has made some investigations concerning the **effects of the hidrotics and antihidrotics** upon the number of leukocytes in the blood, elaborating the previous work of Horbaczewski. He found that the antihidrotics, of which he tested 10, the number including atropin, camphoric acid, tannic acid, pierotoxin, agaricin, and sulphonal, caused a marked decrease in the number of leukocytes. The hidrotics, such as sodium salicylate, pilocarpin, antifebrin, antipyrin, phenacetin, morphin, and Dover's powder, had directly the opposite effect, the number of leukocytes increasing greatly. He believes, therefore, that these drugs have in the one case a positive, and in the other a negative, chemotactic effect. Similar results were obtained in animals. He killed certain animals after administering these drugs, and investigated the number of leukocytes in the peripheral and central circulation, and decided that the changes observed in their number upon counting the blood are due to a difference in their distribution, the hidrotics causing merely a relative increase in the peripheral circulation. From these results Bohland comes to a belief that the sweats of infectious diseases associated with leukocytosis are due to the leukocytes carrying the toxins to the peripheral circulation, the toxins then causing irritation of the sweat-glands and discharge of the toxic material.

S. Kaminer² has investigated the **iodin-reaction** in leukocytes. He finds 3 stages of change producing this reaction. In the first there is a slight, reddish, diffuse coloration of the protoplasm; in the second there are granulations which stain intensely; in the third the whole protoplasm takes an intense stain. The second stage is most common. The reaction occurs, in his experience, constantly in suppuration, in some instances with puerperal fever. It is not diagnostic of these conditions, however, since it occurs in other affections. He has never observed it except with leukocytosis. Believing that if these granules were glycogen they should be found in diabetes, he examined 5 cases of this disease. The reaction was absent in 4; while in 1, though they were present, there was leukocytosis, and the patient was in coma. No postmortem could be obtained in this case, and it is not known whether pus was present. It is not a constant accompaniment of cachexia, and occurs rarely in cachectic states unless they are accompanied by suppuration. The 3 important factors for the production of the reaction are fever, leukocytosis, and the action of toxins. By injection of diphtheria-toxin into guineapigs he produced the reaction in 13 of 15 animals that showed coincident leukocytosis and fever. It was absent in 4 of 5 animals that showed no fever; in the 1 that showed it, leukocytosis was present at the same time. He attempted to produce a reaction with substances, such as spermin, which produce leukocytosis, but in which there is no toxemia; it was always absent. He believes that it is produced by some chemotactic substance, but that this is not necessarily a bacterial protein.

Kaminer,³ in a previous paper, reported the presence of the **iodin-reaction of the leukocytes** in 18 cases of puerperal sepsis. Cases

¹ Centralbl. f. innere Med., Apr. 15, 1899. ² Deutsch. med. Woch., Apr. 13, 1899.

³ Berlin. klin. Woch., Feb. 6, 1899.

with fever, but without general pyemia, as, for example, typhoid fever, phthisis, and scarlet fever, did not give the reaction.

Delezené¹ observed the occurrence of **hyperleukocytosis** after injecting such **anticoagulant substances** as diastase, peptone, eel-serum, and bacterial toxins. This hyperleukocytosis was not due to outwandering of the leukocytes into the perivascular tissues of the abdomen, as some authors have taught, since it occurred when the abdominal circulation was entirely shut off; and it was not a mere peripheral hyperleukocytosis, since the number of leukocytes was diminished in the large vessels. He decides that it was due to both a destruction of the white blood-cells and a general dilatation of the small bloodvessels, leading to the collection of leukocytes in them, this latter statement being the result of his observation of decrease in the number of leukocytes in the large vessels when vasodilatation is caused by section of the cervical cord or of the splanchnics. Subsequent stimulation of the cut ends, with contraction of the vessels, caused the number to approach the normal once more.

A. Gilbert and E. Weil,² in studying 5 cases of chlorosis and 1 of tuberculous chloranemia, found **leukopenia** in 2 cases; while in the others the number varied from 6500 to 9500. In the 2 cases of leukopenia the mononuclear elements were increased to 55% and 50%; the eosinophiles were increased in one case and decreased in the other, and morphologically they showed marked changes; the nuclei were irregular, and the granulations irregularly distributed and of unequal size.

V. Blum³ found the leukocytes diminished in 4 of 5 cases of **influenza**; in the other case the hyperleukocytosis was attributed to a coexisting catarrhal pneumonia. The leukocytes were decreased in 6 of 16 cases of tuberculosis. All of these showed intestinal symptoms, and in 2 of them there was tuberculosis of the peritonemum. He believes that the reduction of the leukocytes in typhoid fever, tuberculosis, and influenza is due to the involvement of the abdominal lymphoid tissue. Digestion-leukocytosis is thought to be due to stimulation of these tissues, and when they are diseased such a leukocytosis cannot occur.

H. Winterberg⁴ describes his own method and apparatus for determining the **amount of ammonia** in the blood, and gives the results of elaborate studies. The normal amount in health varied from 0.6 to 1.3 mg. in 100 cc. of blood, and averaged about 0.9 mg. The variations in fever were great, but showed no distinct relation to the height of the fever. There was strong evidence against uremia being due to the presence of ammonium carbonate in the blood, since a number of individuals with pronounced uremia showed no increase, nor did animals with experimental uremia. Winterberg does not believe that the condition described by v. Jaksch as **ammoniemia** exists. Disease of the liver did not usually cause decrease of urea-production and increase of ammonia; this was not found in cases of cirrhosis, nor was it proved after experimental destruction of a large portion of the liver-parenchyma with sulphuric acid, even when this was accompanied by the production of an Eck's fistula and the arteries were tied so as to exclude blood from the liver

¹ Nouv. Montpellier méd., Nos. 31-34, 1898.

² Compt. rend. de la Soc. de Biol., Feb. 11, 1898.

³ Wien. klin. Woch., Apr. 13, 1899.

⁴ Zeit. f. klin. Med., Band 85, Hefte 5 u. 6.

completely. Only just before death did the urea decrease and the ammonia increase, and such excessive destruction of liver-tissue rarely occurs.

METHODS OF EXAMINATION OF THE BLOOD.

Salkowski¹ describes a **new method** for determining the **alkalinity** of the blood. He places 20 gm. of finely powdered ammonium sulphate of neutral reaction in the glass vessel of the Schlösing apparatus, and dissolves it in 20 cc. of water. A definite quantity of blood—10 to 25 cc.—is then added, and 10 cc. of a 1:10 or 1:4 normal acid solution is placed in the acid vessel of the apparatus. This is allowed to stand for 5 or 6 days, and is then titrated with a 1:10 or 1:4 normal soda solution. The loss in acidity represents the quantity of ammonia set free, and this represents the alkalinity of the blood.

K. Brandenburg² has carried out some investigations on the **alkalinity of the blood**, using titration with 1:19 normal tartaric acid, a method admittedly inexact, but, he believes, rendered useful by determining at the same time the amount of nitrogen in the blood. This he did, and insists that the alkalinity varied in direct relation with the total nitrogen, except in 2 cases of uremia in which the alkalinity was low and the albumin about normal, and therefore there was possible acid intoxication. He found the alkalinity low in youth and in primary and secondary anemias. It varied in fevers, and was increased in catarrhal icterus. The norm varies; he found it equal to from 330 to 370 mg. of NaOH in 100 cc. of blood. The serum alone had an alkalinity equal to 160 to 190 mg. of NaOH. The nitrogen of the blood was normally from 3.4% to 3.7%; while that in the serum was from 1.3% to 1.6%.

P. Des èvre,³ in reviewing the studies of the alkalinity of the blood, finds **physiologic variations**. It is low in youth and after severe muscular exertion; while it increases after eating. It is usually normal or somewhat increased during acute diseases, diminishing somewhat and often becoming subnormal during convalescence. It has no relation to the degree of fever. In chronic diseases it is usually diminished after the affection has been present for some time.

Cora L. Lichty,⁴ in using Hammerschlag's method to determine the **specific gravity** of the blood, employs a mixture of chloroform and benzol. The latter was found much more satisfactory than either benzine or gasoline. A test-tube was filled with this mixture, which has a specific gravity of from 1056 to 1060. She reports her results in 100 cases. She found a constant direct ratio between the specific gravity and the amount of hemoglobin; her results are given in tabular form.

C. Hartwig,⁵ after studying **Bremer's blood-reaction**, decides that it is practically constant in diabetes mellitus, but that it occurs in other conditions without our being able to say under just what circumstances it will occur. The reaction is due to some alteration in the hemoglobin, produced by grape-sugar and probably by other substances. The concentration of sugar which is necessary to cause the reaction with pure hemoglobin is at least 0.15%.

¹ Centraltbl. f. d. med. Wissensch., Dec. 24, 1898.

² Zeit. f. klin. Med., Band 36, Hefte 3 u. 4.

³ Thèse de Lyon, 1897-1898.

⁴ Phila. Med. Jour., July 30, 1898.

⁵ Deutsch. Arch. f. klin. Med., Band 62, Hefte 3 u. 4.

A. G. Phear¹ believes that both the white and the red corpuscles should be **counted from a single preparation**. He advises the use of a camera lucida in order to increase the area used in counting the corpuscles.

E. Hepner² describes a new method for the **estimation of cholesterin** in blood-corpuscles. The chief point in the method is the use of acetic ether for extracting the cholesterin. His figures are much higher than those of others, and this result was due, he says, to the greater accuracy of the method. The amount found seemed to have no relation to the kind of food taken, and did not vary when the animals were freely fed or starved. Hepner has found both the esters of cholesterin and some free cholesterin in the blood-plasma, also.

CHLOROSIS.

Symptomatology.—Gautier³ has studied the clinical **changes in the heart** in chlorosis. He finds that the deep dulness is enlarged in nearly all cases, almost always toward the right. In most of these cases the heart returned to the normal as the chlorosis improved, and he thinks this disproves Virchow's theory of congenital narrowness of the arterial system, since such a permanent condition would cause permanent enlargement of the heart. He believes that the cardiac muscle is commonly weak in chlorosis, and that this causes the heart to tend to dilate. The causes of the weakness are those of the chlorosis.

O. Schaumann and E. V. Willebrand⁴ studied the **regeneration of the blood** during convalescence from chlorosis. The increase in the number of red corpuscles is more rapid than in the amount of the hemoglobin, the red cells frequently increasing beyond the normal amount; their diameter also becomes larger. The authors would explain the difference in the amounts of hemoglobin in the individual corpuscles in pernicious anemia on the one hand, and in chlorosis and traumatic anemia on the other, by the excessive destruction of blood-corpuscles going on in pernicious anemia. The iron derived from the corpuscles destroyed is believed in part to enter into the formation of new hemoglobin. When such a large amount is set free in pernicious anemia the cells retain more than they normally do. In chlorosis there is a deficiency of iron in the body; therefore the hemoglobin increases more slowly than does the number of red cells.

H. Schweitzer⁵ reports 4 cases of **thrombosis** occurring in chlorosis. In 1 the veins of both legs were affected; in 1 those of the right only; in the other 2 it occurred in the left leg. He collects 47 other cases from the literature, and gives a description of the condition based upon the study of the total 51 cases. The etiology is obscure, but it probably results from nutritive changes in the endothelium. All the cases occurred in women or girls. All but 3 of the patients were between 16 and 28 years of age, and most of them were accustomed to hard labor. The vessels affected were either the cerebral sinuses, the veins of the lower extremities, or those of the upper extremities, excepting the 1 instance in which the pulmonary artery was involved. The affection of the cerebral

¹ Lancet, May 20, 1899.

² Pflüger's Archiv, Band 73, Hefte 11 u. 12.

³ Deutsch. Arch. f. klin. Med., Band 62, Hefte 1 u. 2.

⁴ Berlin. klin. Woch., Jan. 16, 1899.

⁵ Virchow's Archiv, Band 152, Heft 2.

sinuses usually showed itself first by severe headache, followed by grave nervous symptoms, such as delirium, convulsions, and paralysis, with variable conditions of the pupils and reflexes. The termination was commonly in death, preceded by coma; though 1 case seems to have recovered. In 24% of the cases the cerebral sinuses were involved. In 74% the veins of the lower extremity were affected, most commonly those of the left leg. The duration in these cases was usually 10 days to 2 weeks. The danger in thrombosis of the veins of the extremities is evidenced by the fact that in 7 cases embolism followed the assumption of the erect posture within 2 to 4 weeks after the onset of the disease; 1 case occurred after apparent embolism of the pulmonary artery, but all the others were fatal.

Treatment.—Brosin¹ describes the results of his treatment with **hot baths** of 50 cases of chlorosis, using a temperature of about 32° R. Cool applications are placed upon the head, and the bath is continued for from 15 to 30 minutes; a cold douche is given subsequently. Three baths are given weekly for from 4 to 6 weeks. The results described are highly satisfactory.

S. Baruch² recommends highly the use of **hydrotherapy** in many chronic conditions, particularly in affections showing chloranemia. In the latter affection the patient should stand in water at 100° F., and be given rapid ablutions with water at 80° F., friction being used at the same time and the temperature of the water being gradually lowered. Other directions as to bathing are given. Baruch particularly recommends hydrotherapy in neurasthenia.

W. F. Summerville³ thinks that the value of **respiratory gymnastics** in treating anemia is commonly overlooked. He attributes many of the symptoms to imperfect aëration of the blood, and finds that proper respiration overcomes much of this.

T. Dumin,⁴ in treating chlorosis, considers as the cardinal points **rest in bed** from 3 to 6 weeks and the administration of Bland's pills. He disapproves of hydrotherapeutic measures in this disease.

A. Hoffmann⁵ records interesting researches concerning the **absorption of organic and inorganic iron**. He gives definite proof of the absorption of the inorganic forms. Portions of the gastrointestinal tract of the animals and human cadavers studied were placed in Hall's solution, and after the sections were cut these also were placed for a time in ammonium sulphid. Excellent results were given by this method. Iron was found in the wall of the duodenum in all instances. Certainly much of it came from the food, but the quantity could be very largely increased by previous administration of inorganic iron preparations. In the animals, absorption of inorganic iron was strikingly proved by feeding guineapigs upon oats (in which there is but little organic iron) and then administering the metal in inorganic combination. A large increase in the amount of iron in the wall of the intestine was noted. The excretion was chiefly from the kidneys and colon. This was proved in several ways, but most strikingly by withholding food and giving iron subcutaneously, after which it appeared in the wall of the colon.

¹ Verhandl. d. XVI. Congresses f. inn. Med., 1898.

² N. Y. Med. Jour., Apr. 1, 1899.

³ Brit. Med. Jour., Oct. 1, 1898.

⁴ Berlin. klin. Woch., Apr. 3, 1899.

⁵ Virchow's Archiv, Band 151, Heft 3

P. Hári¹ has been able to demonstrate the presence of iron in the epithelium of the stomach after this substance had been administered to animals. He states that his earlier experiments were unsuccessful until he put the whole stomach in Hall's solution. By this method small islands of dark color were seen in the gastric mucous membrane; these, when examined microscopically, gave the reaction for iron, and this substance was seen to be within the epithelial cells. He made control-experiments, testing the animals' stomachs when no iron had been given, and obtained from them no reaction; and to prove that **absorption by the stomach-cells** had taken place during life, he introduced a solution of iron into the stomach after the death of the animal. In this case iron was found upon the surface of the epithelial cells, but none within them, showing that in the previous cases it seemed undoubtedly to have been absorbed during life.

Bunge² records experiments carried out at his suggestion by Hausermann. These were based upon the fact that bran contains large amounts of **iron**; whole wheat, barley, and rye, considerable amounts; while the white flour of wheat- and barley-grains, as well as rice, contain only about one-fourth of the amount found in **whole-meal flour**. The conclusion arrived at was that the greater portion of the iron is contained in the outer covering of the grain, and this aroused the question as to whether the digestive processes are sufficient to extract the iron from this portion of the grain, which is only with difficulty digested. Animals, therefore, were fed with white bread and butter, and others of the same litter with wheat-bran bread and butter. The latter series of animals grew much more rapidly, and on being killed it was discovered that they had considerably more hemoglobin in their bodies than those fed upon white bread. They therefore seemed to absorb the iron and to form hemoglobin from it.

A. E. Austin³ has made some experiments upon dogs concerning the **absorption of iron**, giving organic preparations and ferrous sulphate. He found that the blood-corpuscles seemed to increase after the administration of the organic preparations, but decreased while they were being given ferrous sulphate, and investigation showed that upon ferrous sulphate there was no iron-retention; while with the organic preparations there was retention. Austin decides that the inorganic forms of iron, so far as they are represented by ferrous sulphate, are nonabsorbable; but that the organic preparations are absorbed and are the most satisfactory for clinical use. [It has been well determined that inorganic iron is absorbed, and, so far as the experience of numerous observers is concerned, the therapeutic results are at least as good from the use of inorganic preparations as those obtained from the organic.]

Gaule,⁴ in discussing the absorption of iron and the production of hemoglobin, reports that his experiments showed a hemoglobin-increase within 24 hours after giving iron chlorid, and within 72 hours the number of red blood-corpuscles may increase. He investigated the **place of conversion** of inorganic iron **into hemoglobin** by staining with ammonium sulphid. He found that the iron was retained in the spleen,

¹ Arch. f. Verdauungs-Krankh., Band 3, Heft 2.

² Zeit. f. physiol. Chem., Band 25, S. 36.

³ Boston M. and S. Jour., Mar. 2, 1899.

⁴ Zeit. f. Biol., Band 35, S. 377.

and he thought the pulp of the spleen was actively important in the synthesis of the hemoglobin. But the process of the formation of red corpuscles is not completed here, since the red blood-corpuscles are not more numerous in the iron-containing areas of the spleen than elsewhere. The formation is probably completed in the liver and bone-marrow. The removal of the spleen and thymus gland caused no change in the degree of iron-reaction in the spleen.

Schurg¹ made **subcutaneous injections of hemoglobin**, and then investigated the fate of this substance. A certain portion of it was transformed into other products at the point of injection, and subsequently carried away. Most of it, however, entered the circulation as hemoglobin, and was converted into bilirubin by the spleen, bone-marrow, or kidney-cells. If large quantities are introduced, it is deposited; and if excessive quantities are injected, it appears free in the urine and bile.

W. Rosenstein² has made investigations of a large number of preparations made from the **blood of animals**, and which have been recommended by the manufacturers and some physicians for the treatment of anemia. He thinks that such preparations are of little value, since he believes that absorption of iron from the gastrointestinal tract has not been demonstrated. None of the preparations consisted of pure blood. The subcutaneous use of blood or hemoglobin may be of considerable value, as a large part is retained in the organism.

V. Starck³ found that the syrup of iron oxid was better absorbed than either hematogen or hemoglobin, and decides that inorganic preparations of iron are more useful than the organic.

S. Pacilio⁴ has made further investigations of Riva-Rocci's theory that **iron** causes hyperemia of the **blood-forming organs**, and particularly of the bone-marrow. He investigated the total quantity of blood in the bone by dissolving out the blood and estimating the hemoglobin with the Fleischl instrument; and since he found the quantity increased after the administration of iron, he decides that it did cause hyperemia of the bone-marrow. [Certainly, this method of investigation is unreliable.]

H. Birgelin⁵ has used **ferric citrate and ammonio-citrate** subcutaneously, and believes that in the 4 cases in which they were given there was more rapid improvement than when the iron was given internally. In 2 cases, however, the local reaction was so severe that this method of treatment had to be stopped. The solution should be made aseptic and not kept more than 8 days.

C. S. Engel⁶ has had a dried **powder** prepared from **blood-forming organs** of hog embryos, and administered it in the treatment of anemia. He found that the specific gravity of the blood became increased, there was some increase in leukocytes, and a seeming increase in hemoglobin. This preparation, called sanguinoform, is considered of doubtful value even by the author.

¹ Arch. f. exper. Path. u. Pharmakol., Band 41, Heft 1.

² Deutsch. med. Woch., Apr. 27, 1899.

⁴ Gaz. med. di Torino, xlviii., 33.

⁶ Deutsch. med. Woch., Nov. 24, 1898.

³ Ibid., Dec. 22, 1898.

⁵ Münch. med. Woch., July 26, 1898.

PERNICIOUS ANEMIA.

E. Grawitz¹ discusses the **diagnosis, etiology, and treatment** of progressive pernicious anemia. He notes the great difficulty in diagnosis of pernicious anemia from certain other conditions secondary to organic diseases not situated in the blood-making organs. He states that it is impossible to make a diagnosis of pernicious anemia from a simple microscopic study of the blood; the chemical changes are of very great importance, since in pernicious anemia the water in the blood is much increased, and the serum may be as high as 90% of the entire volume of blood. The red corpuscles are, however, chiefly affected, since the serum, though excessive in relative amount, is nearly normal in chemical composition; and this is the point that distinguishes pernicious anemia from many secondary anemias, such as those occurring in tuberculosis; in the latter diseases the blood-serum is affected much more than the red corpuscles. This does not hold true, however, in many secondary anemias, such as those seen with cancer, contracted kidney, and intestinal parasites. The most important characteristic of progressive pernicious anemia is a clinical one, and is its tendency to progress in spite of the removal of the cause, even if the latter can be discovered. As to the etiology, Grawitz notes that the following have been recognized as factors: Gastrointestinal affections of protracted course, in which the disease is probably due to autointoxication from the gastrointestinal tract; pregnancy, in which also there is some probability of autointoxication resulting from the pressure of the gravid uterus on the bowel; repeated hemorrhages, often of minute size; syphilis; bad hygiene and overwork with insufficient nourishment; chronic poisonings; parasites, such as the ankylostomum. As concerns the treatment, there is no specific cure. The cause should be sought, and removed if possible; and in all cases rest should be insisted upon. Lavage of the stomach and intestines is often valuable; other symptomatic treatment may be carried out, but arsenic is, up to the present, the best of known remedies. Grawitz has had no success with bone-marrow. He disapproves somewhat of the name progressive pernicious anemia, since cases have been known to recover, and suggests the term Biermer's anemia.

C. S. Engel² considers pernicious anemia a **reversion to the embryonal form** of blood-development, and describes 5 cases in which the symptoms of pernicious anemia were present, and in all of which he discovered the nucleated red cells, which he calls the early form of metarocytes; *i. e.*, those which take the orange-stain in the triacid mixture and have a large amount of protoplasm with a small nucleus. In 1 case the condition was proved to be due to carcinoma of the stomach. Engel thinks that this is only evidence that pernicious anemia may be due to various causes. He considers it true pernicious anemia, although cancer was present.

H. Strauss³ reported a case of **achylia gastrica and pernicious anemia** in which he had investigated the intestinal absorption, in order to determine whether the anemia was the result of imperfect gastrointestinal functionation. All but 8% of the nitrogen was absorbed, and

¹ Berlin. klin. Woch., Aug. 8 and 15, 1898.

² Virchow's Archiv, Band 153, Heft 3.

³ Berlin. klin. Woch., Mar. 6, 1899.

this is but little below the physiologic limit. Investigation into metabolism showed retention of nitrogen, and fat-absorption was about normal, though the fat-splitting was imperfect; therefore the anemia did not seem the result of imperfect absorption. Absorption was tested also with methylene-blue, and this gave a normal result. The proportion of ammonia to total nitrogen of the urine was normal; therefore there seemed to be no acid intoxication. There were also no ptomaines in the urine. Ferments were absent from the urine and stools.

D. Gerhardt¹ reports a case of **achylia gastrica** associated with progressive pernicious anemia. Death occurred, and the stomach was quickly preserved by being filled at once with alcohol; strange to say, the glands were found almost perfectly preserved, the only noteworthy change being some hyperplasia of the connective tissue, so that atrophy was undoubtedly not the cause of the achylia in this case. He has noted that in a number of cases of carcinoma of the stomach achylia was present early; while the signs of motor insufficiency appeared only a considerable time afterward. He describes also a case which occurred in a man of 32, who had epigastric discomfort and diarrhea, with entire achylia gastrica, but with good preservation, of the motor functions; the feces were normal, excepting for the presence of some mucus. Fat and muscle-fibers were normally digested, so that the pancreatic and liver-secretions seemed to be entirely normal. The absence of hydrochloric acid did not cause excessive intestinal putrefaction, since the ethereal sulphates were not increased and leukocytosis occurred normally. Gerhardt believes that the only valuable treatment in achylia is the use of a diet that promotes the evacuation of the contents of the stomach within the normal time.

Neusser² describes a number of cases of pernicious anemia with **interesting complications**. In the first there was exophthalmic goiter. Toward the end of the disease there were severe diarrhea and vomiting, finally complicated by jaundice. Neusser attributes the latter to the exophthalmic goiter, and believes that it was a jaundice of intoxication. In the second case there was severe pernicious anemia with atrophy of the gastric mucous membrane. In this case complete nitrogen-equilibrium was found to exist. A third case showed coincident pernicious anemia, hemorrhagic diathesis, and hypoplasia of the arteries. This occurred in a pregnant woman; and Neusser compares it to the pernicious anemia due to bothrioccephalus; the blood-forming organs attempt to respond to the increased demand—pregnancy in this case—but in some cases they are unable to do it, in this instance probably because of the hypoplasia of the vascular system. Neusser divides cases of pernicious anemia, according to the method of functioning of the bone-marrow, into those in which there is evidence of degeneration of the bone-marrow, shown by the production of megaloblasts; those in which there is no reaction on the part of the bone-marrow, and those in which the reaction is insufficient.

F. L. Hills³ describes a case of pernicious anemia, complicated by **tuberculous infection of the liver and spleen**, that occurred in an inmate of an insane asylum. She had enlargement of the glands, some fever, and marked anemia, and the blood-count decreased until the record of 155,760 red corpuscles was reached. A few nucleated red corpuscles

¹ Berlin. klin. Woch., Aug. 29, 1898.

² Wien. klin. Woch., Apr. 13, 1899.

³ Boston M. and S. Jour., Dec. 1, 1898.

were discovered. The differential count of the whites showed lymphocytes; 61% of polymorphonuclear, 26% of mononuclear, and 1% of eosinophiles. The patient died rather suddenly; the lymphatic glands were found hard and rather cheesy, and there were yellowish nodules in the liver and spleen, which the author thinks, from the microscopic appearance, were tuberculous. It is noteworthy that this **enormous reduction** of red blood-cells was accompanied by clear mentality.

LEUKEMIA.

Etiology.—Löwit¹ gives a preliminary communication concerning his results from a study of the cause of leukemia, and states that a further and more complete description will appear. In myelogenic leukemia he found a large **ameba**, which multiplied by means of spores. It was present in both the peripheral circulation and the blood-forming organs. In lymphatic leukemia he found the parasites but rarely in the peripheral circulation. In the blood-forming organs he met with a small intracellular ameba. Sometimes the two forms were found together. The parasites were found in pseudoleukemia, also. He states that the infection may be transferred to animals, which develop a chronic disease resembling leukemia, accompanied by a leukocytosis. The ameba is found in the blood, and the affection is transmissible to other animals. He has not been able to cultivate the ameba.

Kojine² records a case of what he believes was **traumatic leukemia**, which occurred in a peasant who had been thrown to the ground during a panic, and suffered repeated blows in the left side of the abdomen. Two weeks later he had swelling of the cervical glands, and from this time grew progressively weaker and became unable to work. Two years after the accident he had evident leukemia, with enormous swelling of the spleen, and increase of the white corpuscles to 600,000 per cmm.

R. Milehner³ reports that in a case of myelogenous leukemia in which there was severe ascites, he found that 23.9% of the leukocytes obtained by centrifugating the ascitic fluid had the morphologic appearance of mast-cells, and 24.9% more of the cells seemed to be mast-cells that had lost their granules. He believes this proves that mast-cells emigrate, and that it also establishes Ehrlich's theory that myelogenous leukemia is an **active leukocytosis**.

Symptomatology.—J. Finlayson⁴ describes a case of splenic leukemia, in a woman of 29, in which he made the diagnosis of **hemorrhage into the retina and into the labyrinth**, because of ringing in the ears and nausea together with conjunctival hemorrhages. Ophthalmoscopic examination showed hemorrhages in the retina. There were no changes and no external symptoms of disease of the middle ear. The postmortem showed that blood had escaped into the vestibule and the first turn of the cochlea. The blood-count given in the case showed 2,080,000 red corpuscles and 1,190,000 white corpuscles.

H. Eichhorst⁵ records a case of leukemia with marked **lesions of the nervous system**. The patient was a boy of 17, who had general

¹ Centrabl. f. Bakt., Parasit. u. Infek., Nos. 8 and 9, 1899.

² Sem. mèd., No. 56, 1898.

⁴ Brit. Med. Jour., Dec. 31, 1898.

³ Zeit. f. klin. Med., Band 37, Hefte 1 u. 2.

⁵ Deutsch. Arch. f. klin. Med., Dec., 1898.

enlargement of the lymphatic glands, with a polymorphonuclear leukocytosis of 41,650. During the latter part of his illness he had increasing loss of power in the legs, associated at first with increase of the reflexes; and subsequently with their disappearance, and with incontinence of the bladder and rectum. The autopsy showed the presence of a grayish tumor arising from the dura of the spinal cord, in the region of the fifth and the seventh thoracic vertebrae, which had caused compression and secondary degeneration. The tumor was composed of small mononuclear cells in a reticular round-tissue. The lymphatic glands were cheesy and soft. The author mentions the possibility of lymphosarcoma, but calls the case one of leukemia, and believes that this diagnosis is substantiated by finding collections of round cells in the kidneys and liver. This, and a case of Rosenstein's, he believes constitute the only records of involvement of the central nervous system in leukemia.

E. R. Baldwin and J. A. Wilder¹ report a case of **lymphatic leukemia associated with pulmonary tuberculosis**. They are unable to state the relation between the diseases in their early stages; the man was first seen for tuberculosis, which appeared to be subsequently arrested. Later he developed marked enlargement of the lymphatic glands and the spleen, and to some extent of the liver, together with a leukocytosis, about 98% of the leukocytes being lymphocytes. Cultures from the blood and from the organs after death were negative. The uric acid was increased in 3 estimations (amount not given). Postmortem examination showed tuberculosis of the lungs, with marked lymphoid infiltration of the organs throughout the body.

W. Moraczewski² investigated the **metabolism** of nitrogen, phosphorus, chlorids, calcium, and sulphur, in 1 case of leukemia and 1 of pseudoleukemia, and also determined the uric acid, urea, xanthin-basis, and ammonia in the urine. In the case of leukemia he found a very striking retention of nitrogen, chlorids, phosphorus, and calcium; on a mixed diet the retention reached 44%, that of phosphorus 48%. The pseudoleukemic case showed marked retention of nitrogen and of chlorids and calcium, but the phosphorus-retention was only 4.4%. Moraczewski speaks of leukemia as a **nitrogen-and-phosphorus disease**, by which he means that the organism needs and retains large quantities of these substances. He found that the administration of extract of spleen to the case of leukemia caused no noteworthy change, excepting increase of the leukocytes with an increase of the ammonia and uric acid in the urine. Inhalations of oxygen caused marked increase of the phosphates and calcium-excretion, with decrease in the ammonia-excretion and some increase in the uric acid. The use of sodium chlorid and calcium phosphate caused a decrease in the nitrogen-retention, and also some increased phosphate-excretion. Thyroid gland caused a marked increase in the excretion of nitrogen and phosphorus, the latter reaching almost an equilibrium. Moraczewski thinks that nitrogen and phosphorus-metabolisms are faulty in leukemia and need stimulation. [Most observers find the nitrogen-loss excessive, and therefore this result was wholly at variance with them. We do not have much confidence in the results of the investigations concerning the metabolism of the mineral salts, owing to the inexact methods by which the amount ingested was determined.]

¹ Am. Jour. Med. Sci., June, 1898.

² Virchow's Archiv, Band 151, Heft 1.

A. Magnus-Levy¹ investigated the metabolism of 3 cases of acute leukemia and 1 of the chronic affection. The acute cases showed the great loss of body-proteids usually described. In one case this reached 24.8 gm. of nitrogen per day. In this case the uric-acid excretion rose as high as 8.72 gm. for 24 hours, and the **xanthin-bases** were increased to 321 mgm. The second case showed a similar nitrogen-loss and uric-acid increase, though the alloxur-bases were not strikingly increased. The third case excreted as much as 27.3 gm. of nitrogen a day, and the amount lost was always excessive. The **uric acid** was increased, its amount varying with the count of leukocytes. The chronic cases, on the contrary, showed only moderate loss of body-proteids and no notable increase in uric acid. Excessive excretion of uric acid is not always found in leukemia, and a number of cases in which this did not occur are collected from the literature. Its relation to the increase of the leukocytes and their destruction is still questionable. There is an undoubted relation between nitrogen-losses and hemorrhages, as exemplified by a case of purpura which Magnus-Levy reports, in which the daily nitrogen-loss sometimes reached 13 gm. He thinks that the **nitrogen-loss** in leukemia is probably **associated with hemorrhages**. One case of acute leukemia showed greatly increased excretion of phosphorus, which Magnus-Levy attributes partly to the proteid destruction, but believes that much of it must have come from the cell-nuclei, since the excretion was too great to be attributable to simple proteid-destruction, and the calcium was not sufficiently increased to permit of considering it as the result of bone-destruction. In 1 case estimations of the uric acid in the blood showed an enormous increase, but this case was complicated with nephritis.

M. H. Fussell, J. H. Jopson, and A. E. Taylor² describe 2 cases of **acute leukemia**, and discuss this condition, tabulating the 55 cases previously reported. In the general description of the disease they note that the streptococci found in some of the cases are probably coincidental or agonal infection. Direct infection seemed established in 1 case. The disease occurs most frequently in early life, 32 of the cases having occurred in patients below 30 years. Males are most frequently affected. The duration of the disease was from 3½ to 63 days, averaging 39 days, though the beginning could not always be definitely determined. Hemorrhage was extremely common in the series, usually as petechiæ; and enlargement of the lymph-glands was still more frequent. Bone-pains and tenderness were common, as were digestive disturbances. Stomatitis has been frequently mentioned, as has exudation upon the tonsils, and fever is common. The changes in the blood were chiefly in the mononuclear leukocytes. The red cells are usually decreased, sometimes to a very severe degree. The leukocytosis is not generally of a marked degree. The prominent point is the presence of large numbers of lymphocytes of varying size. Myelocytes are usually present in small numbers.

J. R. Bradford and H. B. Shaw³ give the records of 5 cases of acute leukemia. The tabulated results of their study show ages varying from 7 to 58 years—4 of the cases being under 30. All were males. The duration of the disease was from 5 to 8 weeks. Among the symptoms, it is

¹ Virchow's Archiv, Band 151, Heft 1.

² Phila. Med. Jour., Jan. 7, 1899.

³ Med.-Chir. Trans., vol. lxxi., p. 343.

to be noted that 4 cases showed purpura, and in 2 melena occurred. Tenderness over the bones was recorded in but 1 case; while it was absent in 2. The thymus was enlarged in 2. There was stomatitis in all of the cases, this having begun some time after the onset of the disease. Post-mortem, it was found that the bone-marrow was hemorrhagic in 1 case, and in this case and 2 others it was red and gelatinous. In 1 case it was puriform; while in another its condition was not noted. There was enlargement of the spleen in 4 cases, general granular enlargement in 2, and local enlargement in 3. The red corpuscles showed marked decrease in all cases, and there was a proportionate decrease of the hemoglobin. The proportion of the whites to the reds varied from 1:3 in one case to 1:43 in another; the conditions in the 3 remaining cases lying between these figures. Differential counts in 3 cases showed a normal number of lymphocytes in 1 case, reduction of their number in the 2 others. In all cases the large lymphocytes were much increased. Myelocytes were present in 2 cases. The polymorphous leukocytes were reduced in 2 cases, and are said to have been absent in 1 case. Nucleated red cells were not found. All the cases showed fever during their course.

Gilbert and Weil¹ report 3 cases of acute leukemia. The first had a duration of 3 months and resembled the chronic disease. The second lasted 5 weeks. There was a severe stomatitis, and the case looked like a stomatitis with general infection. The third case lasted but 15 days, resembling infectious purpura. In discussion, Hayem described a case of acute leukemia he had observed in a pregnant woman, 30 years of age, and which he at first diagnosed purpura hæmorrhagica because of the severe hemorrhagic symptoms, chiefly violent hematuria, which was uncontrollable and finally fatal. Blood-examination, however, showed marked leukocytosis and the presence of nucleated red blood-corpuscles.

Ross² reports a case of **acute lienomedullary leukemia** that occurred in a woman of 27, who had been well up to 5 weeks before, when she had given birth to her first child. The disease lasted only 25 days. There was no fever, and no hemorrhages were present, but she had severe diarrhea.

W. Ewart³ has used **carbonic acid gas** in 2 cases of leukemia, administering oxygen at the same time, and applying galvanism to the region of the spleen for 5 minutes before and for 5 minutes during the administration of the gas. In 2 cases, one in a boy, the other in a young man, the spleen diminished distinctly in size.

THE HEMORRHAGIC DISEASES.

L. Cardeilhac⁴ discusses a condition which he terms **pigmentary cachexia**, resulting from purpura, and which consists of marked pigmentation of various organs. The pigment is evidently produced, partly *in situ* and partly in other portions of the body, from altered hemoglobin. The cause of the pigmentation is largely purpuric conditions, though it may result from traumatism. Cardeilhac thinks that accumulation of a considerable amount of the pigment in the liver or pancreas may cause

¹ Compt. rend. de la Soc. de Biol., Dec. 31, 1898.

² Liverpool Med. Institution, Mar. 23, 1899.

³ Brit. Med. Jour., July 25, 1898.

⁴ Thèse de Paris, 1897-1898.

diabetes. Pigmentation is often seen in alcoholism, malaria, and tuberculosis as a result, he believes, of the destruction of the red blood-corpuscles and the interstitial hemorrhages that occur in these diseases.

J. H. Burch¹ describes a case of **purpura hæmorrhagica** that occurred in a girl of 14. One uncle had died of hemorrhage from a very slight wound; and the girl, when 7 years of age, had had dangerous epistaxis accompanied by chill and a purpuric eruption. In Sept., 1896, she was attacked with hæmatemesis, which came on after a severe chill and high fever. She also had hæmaturia and bleeding from the gums, and subsequently became jaundiced, and also had repeatedly such grave epistaxis as nearly to cause death. The hemorrhages continued at intervals for a year, and she then improved; but 5 months later had another attack with chill, high fever, profuse epistaxis. At this attack the fever continued, the spleen enlarged, and a condition somewhat resembling typhoid fever developed, though the Widal reaction was absent. The attack continued in this case for between 2 and 3 weeks. Frequent dangerous hemorrhages occurred, reducing the blood-count, according to record, to 1,000,000 red cells to the cm. The highly remarkable improvement to 3,800,000 red cells within 2 days is said to have occurred after the hemorrhage stopped. The blood and urine contained a **bacillus** which was nonmotile, but otherwise similar in appearance to the colon-bacillus: this caused a thin growth upon the surface of gelatin, upon potato, and agar-agar. It was pathogenic to a rabbit, causing death within 8 hours; there was hemorrhagic extravasation into the subcutaneous and subserous tissues; while the blood showed no tendency to coagulate, and contained the same bacillus.

E. Cureton² reports a case of hemorrhagic purpura in a boy, 11 years old, who had no history of either rheumatism or hæmophilia. He had fever and was somewhat prostrated, and had become decidedly anemic; the blood oozed from his gums, and his body showed a general purpuric eruption without any joint-changes. He died 20 days after admission to the hospital. The red cells are reported to have diminished to an astonishing degree shortly before death; 3 days before he died they numbered 1,680,000; while on the day of death they were reduced to 310,000. There were hemorrhages in many of the organs, but no other definite lesions. Cultures from the heart's blood showed the presence of **streptococci**.

C. N. B. Camac³ reports a case of purpura, noteworthy for the fact that, although the pallor was extreme, blood-examination showed 85% of hæmoglobin and over 6,000,000 red corpuscles.

E. R. Dawson⁴ reports a case of severe acute purpura hæmorrhagica in a girl 2 years and 11 months of age. It began with severe hæmaturia, followed by purpuric rash, and next day by epistaxis and expectoration of blood. The condition became excessively grave, but an injection of **ergotin** into the left buttock caused almost immediate cessation of the hemorrhage. There was no family history of either rheumatism or hæmophilia.

Arcangeli⁵ used **gelatin injections** in the treatment of 2 cases of purpura hæmorrhagica. The result was wholly successful, and he rec-

¹ Med. News, Apr. 8, 1899.

² Lancet, Feb. 25, 1899.

³ Med. Rec., Dec. 21, 1898.

⁴ Lancet, Jan. 21, 1899.

⁵ Riforma Med., Mar., 28, 1899.

ommends the use of such treatment in practically all forms of hemorrhage met with in medical cases.

W. H. Brown¹ describes a case of **hemophilia** in a boy of 13. He was one of a family of 14 children, and had had 6 brothers, all of whom died of hemorrhage; while all the girls were alive and well. This child had had repeated swellings of the joints, resulting from slight injury, and had had hemorrhage from other causes. After severe hemorrhages, during treatment in the hospital, he grew so weak that he seemed likely to die, but **inhalation of oxygen** caused the hemorrhage to cease, and the child recovered.

A. Fry² has treated 3 cases of hemophilia by injections of **horse-serum**. The patients were 3 brothers of a family of bleeders, 2 others of the family having died from hemorrhage. The 3 patients treated all seemed to recover from the hemorrhagic tendency—for the time being, at any rate.

E. M. Simpson³ believes that he has had valuable results from the use of red **bone-marrow** in the treatment of hemophilia; but the effect was chiefly upon the patient's general condition and appetite, and not upon the bleeding. Calcium chlorid has, in his experience, produced good results upon the bleeding.

Combemale and Gaudier⁴ report good results from the treatment of a case of hemophilia with **thyroid-extract**.

William Pepper and A. E. Taylor⁵ describe 2 interesting cases characterized by repeated **hemorrhages** in the skin and from various mucous surfaces. They were considered to be of **nervous origin**. The first case occurred in an extremely hysterical woman, who had been subject to the hemorrhages for 6 years. In her case symmetric subcutaneous hemorrhages were common; while bleeding from the mucous surfaces was more infrequent. Any nervous shock was likely to bring on a repetition of the hemorrhage. The second patient, a woman of 27, showed no characteristics of hysteria; but in her case, also, fright and other nervous shock were likely to bring on the hemorrhages. She had for months a severe ulcerative stomatitis, due to the formation of submucous hematomas with subsequent necrosis. In this case strikingly beneficial results were obtained from the use of thyroid extract, the effect being considered by the authors to be possibly the result of stimulation of metabolism by the thyroid extract.

DISEASES OF THE SPLEEN.

W. Osler⁶ reports instances of chronic **enlargement of the spleen** with repeated **gastrointestinal hemorrhages**. The curious facts in these cases were the extension of the disease over a long course; the existence of a chlorotic condition of the blood, the hemoglobin being reduced as low as 50%; marked enlargement of the spleen, and the occurrence of severe hemorrhages. The first case had hemorrhages for a period of 12 years, and finally died as a result of a severe hemorrhage. They were always severe, and caused much prostration at the time; but the patient

¹ Lancet, Dec. 6, 1898.

³ Lancet, May 13, 1899.

⁵ Phila. Med. Jour., May 6, 1899.

² Med. Rec., July 23, 1898.

⁴ Quatrième Congrès Franç. de Méd. intern., 1898.

⁶ Edinb. Med. Jour., May 18, 1899.

seemed in good health in the intervals, after the effects of the hemorrhage had passed off. The postmortem examination in this case showed chronic hyperplasia of the spleen; while the liver showed no cirrhosis and but slight fatty change. The second patient had attacks about once a year for a period of 10 years. In this case the spleen was removed. The man recovered entirely. The stomach, duodenum, and liver were found normal at the time of operation. The third case had had attacks of hematemesis for 11 years, and melena had occurred repeatedly during 4 or 5 years.

G. Banti¹ discusses **splenomegaly with cirrhosis of the liver**. He is convinced that it is a separate disease. He finds that it is most common in young persons. It shows no relation to infections. He describes 3 stages: the anemic, the transitional, and the ascitic. The first symptom is enlargement of the spleen; this is followed by anemia, which becomes profound. Nucleated red cells are, however, absent, and the various forms of leukocytes are present in normal proportions. This stage, lasting from 3 to 10 years, is followed by the transitional stage, in which the urine diminishes in quantity and contains an excess of urates and, sometimes, bile-pigments. Then the ascitic stage appears. In this the liver decreases in size, ascites develops, and oftentimes there is icterus, death commonly occurring within about 6 months after the appearance of this stage. Postmortem, there are found enlargement of the spleen, thickening of its capsule, and pigmentation. The liver is small, hard, and granular. There are hyaline degeneration in the Malpighian bodies of the spleen, and oftentimes peculiar irregular pigmented masses in the Malpighian bodies; the veins are found partly affected also, and there is usually marked endophlebitis. Cultures were entirely negative and treatment was ineffectual. Banti suggests that as the spleen is, in his belief, the cause of the whole difficulty, this organ should be removed as early as possible, and, if done at all, always before the last stage of the disease. He thinks that the disease may be due to the production in the spleen of toxic materials.

S. Amberg² reports a case of **echinococcus** of the spleen in a woman of 30. She presented a large mass in the region of the spleen, which was somewhat tender and with a slightly nodular surface. It fluctuated, and upon tapping it echinococcus-hooklets were discovered. Operation was undertaken, the cavity emptied, and the walls sewed fast to the abdominal walls. Rapid improvement and subsequent recovery followed.

E. Hodenpyl³ describes a case in which there was apparent **absence of the spleen**. The patient was a colored man, 32 years of age, whose death was preceded by severe pains, with distention of the abdomen and profound jaundice. The autopsy disclosed great enlargement of the mesenteric lymph-glands, which had caused severe pressure upon the common bile-duct, and thus complete obstruction. The glands were cheesy. No spleen could be found; but Hodenpyl, in reviewing the 9 cases which he has collected of apparent absence of the spleen, shows that only 1 can be accepted without question as an undoubted instance of this condition. In his own case the branches of the celiac axis were not examined, and he can therefore not state dogmatically that the spleen was absent.

¹ Ziegler's Beiträge, Band 24, Heft 1.

² Wien. med. Woch., Oct. 29, 1898.

³ Med. Rec., Nov. 12, 1898.

Ascoli¹ treated a girl, whose spleen had been removed, by the daily administration of 20 gm. of the **pulp of calf's spleen**. Her appetite improved, the urinary excretion was much increased, her weight was augmented, and the blood-count improved greatly, although arsenic and iron had been used before without effect.

ADDISON'S DISEASE.

F. Schultze² does not consider **melanoplakia** of the mucous membrane of the mouth a pathognomonic symptom of Addison's disease. He states that the pigmented spots have been found in the mouths of patients in his clinic in a number of instances when no other signs of Addison's disease were present, particularly in gastric carcinoma and affections of the liver. He thinks that Addison's disease should be diagnosed only when there is pigmentation of the skin together with the other signs of the disease.

Thibierge³ reports the **case of a negro** of 35, who had pigmented patches on the buccal mucous membrane, similar to those seen in Addison's disease. The man stated that the pigmentation of his skin also had become more marked in the 3 years previously; he had lumbar pain and the general severe asthenia characteristic of Addison's disease, and also had tuberculosis.

J. Sellier and H. Verger⁴ report a case of what they consider **Addison's disease with pulmonary tuberculosis**. It occurred in a man, 31 years of age, who had impairment of health, with cough and hemoptysis, and signs of involvement of both apices. The skin became pigmented in certain areas, particularly over the lumbar region. The mucous membranes were free. Extract of suprarenal gland was given him, and there was some improvement in the symptoms, but the pulmonary conditions persisted. [The diagnosis of Addison's disease seems questionable.]

Longour and Gentes⁵ record a case that they diagnosed as a probable instance of **Addison's disease without pigmentation**, owing to the association of progressive asthenia, lumbar pains, and vomiting. Treatment with suprarenal gland caused marked improvement, and after it had been used 2 months the patient was unquestionably much better. About this time the use of a blister caused the appearance of a spot of pigmentation.

C. Turner⁶ describes a case of Addison's disease in which the **blood-pressure**, taken 2 days before the death of the patient, showed a reduction to 73 mm., using Hill and Barnard's sphygmometer, which in normal persons gives a record of from 100 to 125 mm.

Treatment.—A. Foster⁷ describes a case of Addison's disease in a woman of 38, associated with cessation of menstruation and atrophy of the ovaries, uterus, and mammae. The administration of **suprarenal extract** in 5-gr. doses 4 times a day caused improvement at first, which was succeeded by severe symptoms that resulted in death.

¹ Gaz. hebdom. de Méd. et de Chir., Sept. 15, 1898.

² Deutsch. med. Woch., Nov. 17, 1898.

³ Jour. de Méd. de Bordeaux, Oct. 23, 1898.

⁴ Gaz. hebdom. de Méd. et de Chir., June 8, 1899.

⁵ Lancet, June 10, 1899.

⁶ Gaz. des Hôpitaux, Feb. 24, 1899.

⁷ Ibid.

Rendu¹ reports 2 cases of Addison's disease, one of which resulted fatally because of general miliary tuberculosis; the other was regarded as an evidence of the danger that may exist in using **orrhotherapy** in these cases. The patient had been doing well until suprarenal gland was administered in the hope of increasing improvement. She soon showed marked albuminuria, grew rapidly worse, and died suddenly.

M. Pickhardt² investigated the **metabolism** in a case of Addison's disease in which the patient had been put upon suprarenal gland, and found that it caused nitrogen-loss together with distinct diminution in weight. Senator's results were contrary to this; and Pickhardt therefore states that his results indicate only the necessity for care in the use of this substance, and are not sufficient bases for dogmatic statements.

Martin³ describes the case of a woman of 37, who had the typical appearance of Addison's disease, and who was treated by subcutaneous injections of suprarenal gland. The first injections produced attacks of syncope, which became less, and ultimately the dose could be considerably increased. The pigmentation vanished, she regained much strength, and was demonstrated as practically cured. Martin thought that the suprarenal extract gave opportunity for **compensatory hypertrophy** of accessory suprarenal glands.

Hemet⁴ recommends the subcutaneous use of **suprarenal extract** in treating Addison's disease, though he considers administration by the mouth preferable. He believes that the reports of lack of success from this treatment of Addison's disease are due to the fact that imperfect preparations of the gland were used.

F. Robin⁵ emphasizes the fact that a case of Addison's disease, previously reported by Bécère as treated by the administration of suprarenal gland, has shown persistent good health for 3 years. The effects of suprarenal gland differ from those of thyroid gland, since any improvement from the use of the latter usually does not persist after the gland has been stopped. Robin thinks that the **persistent effect** of the suprarenal may be due to its causing compensatory hypertrophy of any healthy portion of the patient's glands that remains.

Destot⁶ describes a case of Addison's disease treated with suprarenal extract. There was **decided improvement** at first, particularly in the pigmentation; but the gastrointestinal tract was so irritated by the injections that they were stopped, and the patient rapidly succumbed.

J. J. Abel⁷ has isolated a substance which he considers the **active principle** of the **suprarenal gland**. This was neither pyrocatechin nor a derivative of this substance. It resembles the alkaloids, and has a very different effect from that of the suprarenal gland, since it does not cause a rise in blood-pressure.

A. F. Plicque⁸ insists upon the importance of **absolute rest** and the administration of very light diet in the treatment of Addison's disease. Many symptoms, especially the vomiting, are improved by the inhalation of oxygen; and this symptom is improved sometimes after galvanization of the pneumogastriacs. He thinks that antisyphilitic treatment should

¹ Gaz. des Hôpitanx.

³ Bull. méd., p. 516, 1898.

⁵ Ibid.

⁷ Johns Hopkins Hosp. Bull., Sept. and Oct., 1898.

² Berlin. klin. Woch., Aug. 15, 1898.

⁴ Thèse de Paris, 1897, 1898.

⁶ Lyon méd., No. 48, 1898.

⁸ Presse méd., Jan., 1898.

be used in some instances, though with much care. Symptoms similar to Addison's disease have repeatedly occurred in syphilitics. [Notwithstanding the very encouraging results that have been reported by some clinicians, the value of suprarenal extracts is still very questionable.]

E. Sergent and L. Bernard¹ describe a case in which sudden death occurred with the appearance of violent acute poisoning, while the autopsy showed only **caseation** of both suprarenal glands. They think that there is evidence that an **acute affection** exists which is **due to disease of the suprarenal glands**, and presents symptoms similar to those caused by the experimental removal of the glands.

W. Janowski² describes a case of **primary suppuration of both suprarenal glands**. The patient was a married woman, 25 years of age, whose illness began with repeated chills, followed by pain in the back, in the region of the kidneys. There was swelling over the spine and the lower part of the right chest, and this region was excessively tender. Subdiaphragmatic abscess was suspected, but excluded by puncture, and the condition was believed to be perinephric abscess. Lumbar incision evacuated 100 cc. of pus. The patient was pregnant at the time, and miscarried on the following day and died within an hour. At the post-mortem only the suprarenal bodies were found diseased, both of these glands having been transformed into large capsules filled with offensive pus, which contained remains of the glandular tissue. It is thought that the destruction of the suprarenals perhaps accounts for the rapid death of the patient after the miscarriage, owing to their important effect upon blood-pressure. The heart had been exceedingly weak, the first sound was very feeble, and the pulse also excessively weak. The urine was of brownish color, perhaps from the presence of hematoporphyrin. The author suggests that suppuration of the suprarenal might be diagnosed in the future by the observation of weak pulse, feeble heart-sound, and dark pigmentation of the urine.

DISEASES OF THE PERICARDIUM.

J. Demange and L. Spillmann³ record 2 cases of severe **pericarditis** in which **paracentesis** was practised and recovery followed. It is interesting to note that in the first case the pericardial fluid, which was a serous exudate containing a small amount of fibrin, proved sterile; while cultures made from blood removed from a vein by a syringe gave a pure growth of the **Staphylococcus aureus**. The authors consider paracentesis of the pericardium no more dangerous than the same operation upon the pleura or peritoneum.

G. G. Sears⁴ describes a case of **hemorrhagic pericarditis**. In the exudates removed from this case the **pneumococcus** was discovered in pure culture. The disease had begun with rheumatism, and there had been a systolic heart-murmur. Improvement followed the use of salicylates; but the rheumatism recurred, pneumonia and pleurisy developed, and pericarditis occurred with this attack. Recovery ensued upon tapping the pericardium. [It is well to recall the fact that all exudates in

¹ Compt. rend. de la Soc. de Biol., Dec. 24, 1898.

² Brit. Med. Jour., July 25, 1898.

³ Gaz. hebdom. de Méd. et de Chir., Sept. 11, 1898.

⁴ Boston M. and S. Jour., Sept. 22, 1898.

the pericardium are apt to be quite hemorrhagic as compared with pleural effusions.]

Nachod¹ describes a case in which symptoms of pericarditis were followed by those of failure of cardiac compensation, edema of the feet, and ascites, with enlargement of the liver. The ascites became so great that laparotomy was performed for relief and for exploration. The liver was found smooth, hard, and cyanotic. Repeated subsequent puncture was undertaken, but the patient died; autopsy showed tuberculosis of the peritoneum, adherent **pericarditis, and cirrhosis of the liver** from passive congestion.

J. H. Burtenshaw² reports the case of a man of 60, with pericardial effusion, the collection of fluid having come on very rapidly without discoverable cause. The man had characteristic attacks of **asthma** before the onset of the pericarditis, but the formation of the effusion caused these attacks to disappear entirely. Paracentesis was done, with some improvement, but the man died about a month later.

T. Harris³ reports an unusual case of **pulsus paradoxus on one side only**. The patient was a girl of 16, who had fibrous mediastino-pericarditis, with consequent dilatation of the heart and circulatory stagnation. The left pulse was much more irregular than the right, and both palpation and sphygmograms showed that the left pulse was paradoxical, while the right was not. The autopsy showed that the arteries running to the upper extremities were of the same lumen on both sides, though there were adhesions to the large vessels, and this may have been active in the causation. The greater length and narrowness of the left subclavian, as compared with the left innominate, render this more likely to compression by adhesions, and therefore left-sided paradoxical pulse is more common.

Girandean⁴ believes that the **removal of pericardial exudates** should be undertaken as soon as it is determined that they are of considerable size; and he thinks that tapping should always be preferred to incision, even in purulent cases, unless the exudate is already putrid. Tapping should be repeated; but in purulent cases, if exudate collects again, an incision should be made.

DISEASES OF THE HEART.

Methods of Examination.—H. C. Zeehuisen,⁵ in considering the **effects of the body-position** upon the physical phenomena of the heart in adolescence, notes that the change from a horizontal posture to a vertical causes the apex-beat to assume a lower position, it being usually in the fifth intercostal space when the individual is vertical, and in the fourth intercostal space when he is in a horizontal position. Oftentimes, also, an area of dulness beneath the sternum is discovered when the individual is horizontal; while this vanishes when he assumes the vertical position. Both changes are due to the fact that in the horizontal position the thorax and diaphragm are in the position of expiration; while this changes to a position of inspiration upon assumption of the vertical post-

¹ Prag. med. Woch., No. 26, 1898.

² Med. News, Mar. 11, 1899.

³ Lancet, Apr. 22, 1899.

⁴ Sem. méd., Sept. 14, 1898.

⁵ Centralbl. f. innere Med., Mar. 11, 1899.

ure. Murmurs are often heard much more distinctly when the patient is lying down than when he sits or stands. This also is due to the fact that the vertical posture is associated with the inspiratory position of the thorax, the heart being then more completely covered by the lungs, and murmurs or reduplication of the second sound being less distinctly transmitted to the ear. This is also noteworthy, even in health, in the case of accentuation of the second sound of the aorta. Zeehuisen finds that normally the pulmonary second sound is better heard than the aortic when the patient is horizontal; this is less noteworthy when he assumes the vertical position. Zeehuisen also directs attention to the fact that with the change of position of the thorax from that of expiration to that of inspiration there occurs a marked alteration of the relative position of the ribs and overlying skin, so that areas marked out on the skin in relation to the ribs are very different when the patient is in different positions. The result of this is that the percussion-area of the horizontal position grows greater upward and to the left when the patient assumes the upright posture. He believes that the cardiac phenomena, with the exception of those occurring at the aortic orifice, are better ausculted when the patient is in a horizontal position. For the discovery of modifications of sounds about the aorta, however, he states that the vertical posture is best. He especially directs attention to the fact that most office-patients are examined only when sitting or standing, and that therefore abnormalities which might be evident in a horizontal posture are often overlooked.

M. Pfandner¹ gives a description, with illustrations, of a **graphic method** for recording what is heard upon **auscultation** of the heart.

K. Walz² states that with the help of properly arranged **oblique illumination** one is able to observe such slight shadows as are produced by the pulse-wave, the movement of the skin overlying arteries, and various other similarly slight changes. He believes that he can determine even the secondary waves of the pulse, as well as a moderate increase in peristalsis; the movement of the gravid uterus, and even of the fetus within; muscular twitchings; movement of the fluid in ascites; and various other conditions. He recommends the more frequent and careful use of oblique illumination for studying shadows.

General Symptomatology.—J. E. Squire³ discusses a **cardio-pulmonary murmur** that may be heard in various parts of the chest, being limited to a certain portion of the lung, and being caused by rhythmic compression of the lungs by the heart. [It is certainly questionable whether the cardiopulmonary murmurs are produced by compression or aspiration.] The alternate distention and recoil of the aorta and pulmonary arteries also perhaps contributed to its production. He describes 23 cases in which this was present; in 14 there was tuberculosis of the lungs. The murmur was most commonly heard during inspiration; often during both inspiration and expiration. In many instances he has found the sound postsystolic.

S. Talma⁴ gives the conclusions which his student, Van Dorsten, has reached in **experimental** work in the production of **inorganic heart-murmurs**. Oligemia was produced by bloodletting, and hydremia by injection of salt solution; and it was found that oligemia was rarely

¹ Wien. klin. Woch., Dec. 1, 1898.

² Centralbl. f. innere Med., Feb. 11, 1899.

³ Brit. Med. Jour., Dec. 10, 1898.

⁴ Berlin. klin. Woch., Nov. 21, 1898.

the cause of heart-murmurs; while hydremia, and especially hydremic plethora, frequently gave origin to them, particularly to such as arise in the conus arteriosis of the right ventricle. The administration of quinin caused dilatation of the heart-cavities, and murmurs similar to those in chlorosis were produced in the heart and arteries. Decrease in the frequency of the pulse, with marked distention of the cavities, aided in the production of the murmurs, as did strengthening the systole. It was also determined that these murmurs were quite clearly limited to those regions of the chest that correspond to their point of origin. The limit within which murmurs were heard were marked off by introducing pins, and upon postmortem examination, especially when the murmurs arose in the conus, this portion of the heart was found closely marked off by the pins which had indicated the limit within which the murmur was heard.

C. F. Hoover¹ discusses the **causation of functional heart-murmurs**, and expresses his belief that most of them are of cardiopulmonary origin. They do not show any constant relation with dilatation of the heart nor with anemia, and they are heard most frequently over the pulmonary region; while if they were due to the blood-condition they would probably be more frequent over the aorta, since the blood-current is more rapid here, and the change in the lumen in the passage into the aorta is more marked, than when the blood flows into the pulmonary artery. Cardiopulmonary murmurs are produced by compression of the lung, or by aspiration when the heart recedes; a sound is produced because of the rapidity with which the movement takes place, this statement meeting the objection that the normal passage of air through the bronchi into the infundibulum does not produce a local sound. These murmurs are usually largely dependent upon the phase of respiration for their intensity and character; though this is not necessarily so, since the murmur is not dependent upon respiration so much as upon the movements of the heart.

W. Ewart,² in writing of the **second sounds** of the heart, states that in his opinion the pulmonary second sound is heard over a very limited area surrounding the second left interspace, and that beyond this position the second sound which is heard is aortic; therefore the second sound heard over the right ventricle is not the pulmonary sound, but the aortic.

J. Mackenzie³ discusses a number of **cardiograms** which he presents. He believes that the apex-beat is due to the forward thrust of the left ventricle. He insists, however, that during the ventricular systole the neighboring tissues are drawn in; and he believes that this causes retraction of the skin and subcutaneous tissues also, and in numerous instances gives rise to a condition similar to that described as pathognomonic of adhesive pericarditis, while at autopsy the pericardium is found normal. Mackenzie states that the liver moves during the heart-phases, as the result of aspiration; but contends that the movement is upward during the systole and downward during diastole. He states also that with dilatation of the heart the ventricular systole of the right heart communicates pulsation to the liver.

N. Pitt⁴ has had 2 **remarkable cases of ulcerative endocarditis** under his care. The first began with severe pain in the back,

¹ N. Y. Med. Jour., Aug. 6, 1898.

² Edinb. Med. Jour., Aug., 1898.

³ Ibid., Sept., 1898.

⁴ Practitioner, Nov., 1898.

and inability to move the lower spine upon stooping, followed by incontinence of feces and urine—symptoms suggesting organic lesion of the spinal cord. The symptoms disappeared, however, and those of ulcerative endocarditis took their place. The earlier symptoms were probably due to emboli of the small vessels of the cord. The second case had pain in the back and hip in the beginning, with petechiæ. There were cardiac murmur and fever. Pain in the lumbar region became severe, incontinence of feces appeared, and it was thought that the case was spinal caries. The spinal symptoms vanished, those of ulcerative endocarditis became prominent, and death occurred. Recent vegetations were found on the mitral valves.

L. Herzog¹ reports 9 cases of ulcerative endocarditis, 6 of them occurring in men and 3 in women. In 1 the right heart (pulmonary valve) was affected; in the others the lesion was on the left side. In 1 case there was marked tendency to **hemorrhages from the mouth**, possibly the result of cirrhosis of the liver. In 1 case the disease was associated with malaria.

C. O'Donovan² records a case of fatal **endocarditis without fever**. There was no history of rheumatism, but there were abdominal pains. These improved, and a week later there was again distress, particularly over the precordia, and there was a murmur of aortic regurgitation. A systolic murmur appeared later, and persisted, varying in intensity. There was a noticeable presystolic bruit 9 days afterward. The patient improved after 6 weeks; but not long after overexerted himself, had severe loss of compensation, and soon died.

W. R. Matthews and B. V. Moir³ report a case which ran an obscure course, in which typhoid fever was considered the most probable diagnosis, and the **Widal test** reacted positively, though not distinctly. A subsequent reaction was marked. This confused the diagnosis, however, since a postmortem examination showed that the disease was ulcerative endocarditis.

Thayer and Lazear⁴ report a case of **ulcerative endocarditis of gonorrheal origin**, and discuss the cases reported. In 15 in which the diagnosis was certain there was affection of the right side; in 9 a striking frequency. The right side was involved in the case reported. In discussing the cases recorded, they note that a general septicemia may occur from gonorrhea, and that this disease may give rise to an endocarditis, though this endocarditis or the general infection occurring in gonorrhea may prove to be the result of infection with other microorganisms. Pericarditis may be of gonorrheal origin; but endocarditis is more common. Marked changes in the endocardium are frequent in gonorrheal septicemia. In this case gonococci were found in the blood during life and in the vegetations in the heart after death.

H. W. Berg⁵ describes the case of a man of 21, who, during an attack of gonorrhea, had rheumatic swelling of the joints, with markedly **remittent fever**, and occasionally chills. He grew worse, convulsions came on, and he finally became unconscious and died. The autopsy showed what was believed to be a general infection with the gonococcus,

¹ Deutsch. med. Woch., Nov. 10, 1898.

² Med. News, July 23, 1898.

³ Brit. Med. Jour., June 22, 1899.

⁴ Jour. Exper. Med., Jan., 1899.

⁵ Med. Rec., Apr. 29, 1899.

causing pyelonephritis, right-sided pleurisy, and an ulcerative endocarditis of the aortic valve. In the exudate on the latter were found diplococci, which, owing to their staining-reactions and morphology, were believed to be gonococci. Gonococci were found in the pelvis of the kidney.

Moritz¹ has treated a case of **malignant endocarditis** with **anti-staphylococcic serum**, with a successful result. Six injections of 5 cc. each sufficed to dissipate the acute symptoms. The injections were begun on March 25, after 2 months' illness, and in about 2 weeks the temperature became normal; the man remained in good condition 6 weeks later, though a heart-murmur persisted and the pulse remained excessively rapid.

B. M. H. Rogers² used 5 injections of 10 cc. each of **antistreptococcic serum** in a case of ulcerative endocarditis, in which pure cultures of streptococcus had been obtained from the blood. The injections caused violent pain, and were wholly without effect, and death occurred. Post-mortem cultures yielded streptococci and staphylococci, the latter being thought to be a post-mortem infection.

J. H. Abram³ reports a case of **infectious endocarditis** treated by antistreptococcic serum after streptococci had been found in the blood. The case was fatal; but it was found after death that streptococci had disappeared, and that there was then a general staphylococcic infection. The serum is believed to have caused the disappearance of the streptococci.

CHRONIC VALVULAR DISEASE.

Riegel⁴ reports a number of cases of disease of the heart, with extensive dropsy, in which the administration of diuretics caused rapid disappearance of the dropsy and the coincident occurrence of symptoms of marked intoxication, some of the cases showing **somnolence and delirium**; while the more serious cases went into coma, and 1 patient died. The symptoms were thought to be due to intoxication by substances contained in the dropsical fluid.

J. Telgmann⁵ reports 5 analogous cases. The patients were from 45 to 76 years of age. None of them had fever; there was a slight amount of albumin in the urine in 3 cases, but this vanished after rest in bed or strengthening the heart with digitalis. In no case was there any appearance of uremia; twitchings, somnolence, and evidence of marked involvement of the kidneys were absent. There was no sign of embolism in any case. All the patients had delirium, which came on suddenly, and which was repeated a number of times, the duration of the attacks and their severity depending largely upon the severity of the **cardiac weakness**. In all cases the delirium was very active, accompanied by gesticulations and outcries, and in each case by the delusion that the patient was in strange surroundings and was being prevented from returning to his home. In 2 of these cases, at least, this could not have been due to intoxication with substances in the fluid of the edema, since these 2 cases showed practically no edema, and the attacks occurred only after sudden overstrain of the heart.

¹ Serumtherapie bei Endocarditis maligna, St. Petersburg, 1898.

² Lancet, June 10, 1899.

⁴ Deutsch. med. Woch., No. 51, 1898, Vereins-Beilage.

³ Ibid., Feb. 25, 1899.

⁵ Ibid., May 11, 1899.

A. E. Sansom¹ discusses the treatment of chronic heart-disease due to rheumatism, and states his belief that practically all cases of heart-disease in individuals below 35 years of age are rheumatic. **Rheumatism of the endocardium** may occur during intrauterine life. Sansom describes a case in which 1 of the fetal heart-sounds was discovered to be replaced by a harsh murmur; at the child's death, shortly after birth, there were found great hypertrophy of the right chambers of the heart and vegetative endocarditis of the tricuspid valves. Sansom believes that practically all **fetal endocarditis** is rheumatic. In early childhood the rheumatic process tends to affect the myocardium and pericardium as well as the endocardium. He states that digitalis may be properly administered if there is no febrile disturbance and no evidence of acute inflammation; but if these are present, it often does harm; and if it does not do good after 2 or 3 days, it should be omitted. Locally he prefers the application of an ice-bag. Muscular exercise is commonly used too indiscriminately, and should be preceded by a period of absolute rest if the heart is much enlarged. He records a case in which sudden dilatation of the heart occurred repeatedly and seemed likely to cause death, but the patient was tided over a very severe attack by applying a continuous galvanic current to the course of the vagus. He especially insists upon the importance of the nervous element in cardiac disease, and believes that the frequent employment, over a long period, of a continuous galvanic current is probably of value.

N. S. Davis, Jr.,² in discussing the **prognosis** in chronic valvular affection of the heart, suggests that actual recovery from a valvular lesion may take place by enlargement of a healthy valve to replace the deformity caused by disease of another. He has observed 3 fatal cases of valvular disease. The average age of death in mitral stenosis is 50 years; in mitral insufficiency it is 40 years; and in aortic disease 36 years. In 250 cases which he records, he found that the average duration of compensation in mitral insufficiency was 5.1 years; in mitral stenosis, 11.5 years; in aortic stenosis, 7 years; and in mitral insufficiency, 2.3 years. The mitral lesions commonly cause death earlier, because they are likely to occur earlier in life, and they also lose their compensation rapidly. The duration after loss of compensation varied relatively little. It was shortest in mitral insufficiency (2.6 years); longest in aortic stenosis (3.8 years).

G. A. Gibson,³ in discussing the elements of prognosis in cardiac disease, states that **aortic incompetency** is the most dangerous of all valvular affections. The condition of the wall of the heart is the one which is essential in prognosis. He has endeavored to learn whether the electromotive force generated by the heart was a factor in prognosis. He investigated the change in an electrometer during the cardiac pulsations. No constant relation could be determined, though the variations in feeble circulation were unusually small.

W. T. Gairdner,⁴ in discussing the **relation of cardiac disease to life insurance**, mentioned a number of cases in which individuals the subjects of heart-disease had lived much longer than the expected period. It is difficult to say absolutely how much influence upon the

¹ Lancet, Dec. 10, 1898.

³ Lancet, Nov. 5, 1898.

² Med. News, June 17, 1899.

⁴ Brit. Med. Jour., Sept. 17, 1898.

issuance of an insurance policy the existence of disease of the heart should have; but it is probable that insurance societies are too severe in their restrictions. Diseases of the pericardium, Gairdner says, do not necessarily lessen the duration of life, and he believes that an acute pericarditis may disappear altogether. The functional affections of the heart present difficult questions for medical examiners; intermittence often means absolutely nothing, so far as duration of life is concerned, and the same is frequently true of bradycardia and tachycardia, though a pulse below 50 or over 100 is believed to indicate some lesion. Chorea is thought to be usually associated with organic disease of the heart. In discussion, Thompson mentioned cases in which the pulse was usually about 32, but in which life was prolonged beyond the usual period. Poynton noted the importance of rheumatic affections of the heart that arose in childhood, since the damage to the heart is likely to be much greater when the difficulty begins in childhood than when it originates in adult life.

Mitral Stenosis.—G. B. Hunt,¹ after large numbers of clinical examinations, decides that the **diastolic murmur** in an early and well-compensated case of mitral stenosis is always presystolic; while when lack of compensation appears there is often a murmur in the first half of the diastole, and in the latter case there is almost always a systolic murmur, also. The explanation of the appearance of the early diastolic murmur, as given by Hunt, is that the systole of the ventricle drives the blood back through the auriculoventricular orifice which has become incompetent, and this leads to further overdistention of the auricle and pulmonary veins. Their elastic recoil drives some of the blood back through the orifice at the beginning of the diastole, and this causes the murmur.

P. Cordonnier² has studied the question of the **diagnosis** of mitral stenosis by determining a **dorsal dulness**. Deep percussion along the side of the sixth and seventh dorsal vertebrae shows some dulness in normal cases. This becomes much more marked, and occupies an area 4 to 8 cm. in diameter in cases of mitral stenosis, and is important in differentiating this affection from regurgitation at the aortic orifice. [Our experience of this method has been very unsatisfactory.]

Aortic Regurgitation.—P. M. Chapman³ describes some tracings which he has made, and from which he reached the conclusion that the **heart-radial interval** may be very decidedly increased in cases of aortic regurgitation. His observations were made in a patient presenting simple aortic regurgitation, and simultaneous tracings were taken of the heart-impulse and the radial pulse. There was a noteworthy delay; the normal delay is not more than 0.2 second, while in this case it was 0.53 second. It was also noteworthy that the systole was much prolonged and the diastole shortened. In this case, in 24 hours there were 14 $\frac{3}{4}$ hours of work and 9 $\frac{1}{4}$ hours of rest; while normally there should be 8 hours and 55 minutes of work and 15 hours and 5 minutes of rest. Chapman believes that this is a method of compensation, the excessive work compensating for the difficulty in accomplishing results. The heart-radial delay is believed to be due to the fact that the intraventricular blood-pressure is high when systole begins, and the contraction is therefore

¹ *Lancet*, Mar. 25, 1899.

² *Thèse de Lyon*, 1898-1899.

³ *Lancet*, July 2, 1898.

slow; a further cause of the delay is in the fact that the pulse-wave arising from a slow contraction is itself slow.

J. Mackenzie¹ considers that the common belief that the pulse is retarded in aortic regurgitation is erroneous. He has constructed an apparatus for the simultaneous study of distant pulses and of the heart-beat. By means of this apparatus the pulsations are recorded at the same time upon the same paper, and from a study of these tracings he believes that he is entirely justified in stating that there is no more retardation of the pulse in aortic regurgitation than there is in health. The apparatus which he used consisted of a Dudgeon's or von Jaquet's **sphygmograph**, to which was attached a tambour, and to this there was connected an India-rubber tube, which had at its farther end a small cup. This cup was placed over distant pulsating parts, and the air contained in the cavity of the cup transmitted the pulsation to the tambour.

R. Geigell² has repeatedly observed a **double murmur over the femoral artery** without aortic regurgitation, and considers that the second murmur arises in the vein, the pressure of the stethoscope first preventing the outflow of blood from the vein. Relief of the pressure causes rapid inflow into the iliac vein; while the femoral vein still remains somewhat compressed, and thus gives rise to a murmur from the temporary stenosis.

F. Ostwalt³ reports the case of a man, 68 years of age, who came under treatment for embolism of the central artery of the retina. He had overexerted himself severely a week before, and upon examination it was found that he had aortic regurgitation. From a study of the case, Ostwalt decided that there had been a **rupture of an aortic cusp**, since the cardiac disturbance had come on directly after the overstrain. Contrary to the usual experience, the man had no pain.

T. W. Griffith⁴ reports the postmortem record of a case of heart-disease in which there was pericarditis, with mitral and aortic valvular disease; on the ventricular side of the **mitral valve**, which was much stenosed and indurated, there was a **circumscribed necrosis**, with loss of tissue, giving the appearance of an ulcer. This was thought to have resulted from the impact of the regurgitant blood in coming from the aorta.

E. Grawitz⁵ reports the case of a woman, 44 years of age, who had, with the usual signs of **aortic insufficiency**, such marked **enlargement of the liver** as to lead to the suspicion of a new growth, since there were no signs of marked passive congestion in any other region. The postmortem examination showed, however, that it was the result of passive congestion caused by compression of the inferior vena cava through the projection of the enlarged left ventricle toward the right side. This caused stagnation in the liver alone, since a sufficient collateral circulation through the azygos vein had prevented edema of the lower extremities. In similar enlargements of the liver, of doubtful nature, Grawitz believes the x-rays should be used to determine the lateral limits of the heart; right-sided enlargement would indicate venous stagnation.

¹ Edinb. Med. Jour., Oct., 1898.

² Münch. med. Woch., No. 27, 1898.

³ Berlin. klin. Woch., Jan. 23, 1899.

⁴ Brit. Med. Jour., Dec. 3, 1898.

⁵ Deutsch. med. Woch., May 18, 1899.

CONGENITAL LESIONS OF THE HEART.

F. Brunner¹ reports a case of **obliteration of the aorta and persistence of the ductus Botalli**, which was combined with tuberculosis of the lungs and lymphatic glands. During life there had been notable pulsation of the superficial arteries, and a systolic murmur over the aorta and tricuspid area. He would explain the occurrence of this anomaly through abnormality in the closure of the ductus Botalli, which occurs after birth and takes place through the formation of granulation-tissue in the tissue of the duct. This granulation-tissue, he says, may be displaced and occur only in the aorta, when the involutional processes would lead to stenosis of the aorta, instead of stenosis of the duct.

Rabé² records a case of persistence of the ductus Botalli, in which embolism occurred in the spleen and kidneys. This the autopsy showed to be a **paradoxical embolism**, since there was no appearance of thrombus-formation in the left side of the heart; while there were numerous thrombi on the right side.

Diseases of the Myocardium.—Boy-Teissier and Sesques³ describe a change in the heart which they believe is a normal alteration occurring in aged individuals, and which they term **xerosis of the heart**. It causes a slight degree of enlargement of the organ, and there are usually a few milky patches on the pericardium; while the endocardium remains normal. Microscopic examination shows a change consisting practically entirely in a general increase of the connective tissue, the muscular tissue remaining almost normal, and the bloodvessels showing no especially localized change, though there is often some proliferation of the connective tissue of their walls. The most striking point, however, is that the connective tissue lying between the bundles of muscle-fibers is everywhere increased. The process thus differs from arteriosclerosis in being a general increase of the normal connective tissue, and not one limited chiefly to the vessels; and they believe that it is not dependent upon arteriosclerosis, since they have found it only in very aged individuals, and oftentimes unassociated with arteriosclerosis. The clinical signs caused by it are some displacement of the apex-beat downward and to the left, slight enlargement of the heart, and sometimes some weakness of the first sound, though murmurs and striking changes upon auscultation are absent. One noteworthy symptom is the tendency to rapidity of the pulse upon slight exertion. The arteries show no change, and the sphygmogram is normal. Subjective symptoms are practically absent, though the patients sometimes complain of precordial pain, and there are occasionally tender points over the heart.

J. Jacob⁴ presents further proof of the theory of the **angiospastic** origin of certain cases of **dilatation** of the heart which present the history of attacks of a feeling of coldness, with precordial anxiety, dyspnea, coldness of the skin, and lessening of skin sensibility. He presents the records of 3 new cases, all of which had such symptoms; in all the cases the second heart-sound was found louder than the first at the apex while the attacks were in progress; and this sign convinces Jacob that

¹ Deutsch. med. Woch., Dec. 15, 1898.

² Gaz. hebdom. de Méd. et de Chir., Apr. 30, 1899.

³ Rev. de Méd., Jan., 1899.

⁴ Zeit. f. klin. Med., Band 36, Hefte 3 u. 4.

the vessels of the general system are in spasm during the attacks. He also observed *pulsus bigeminus* in one case; and this he believes is further proof of vascular spasm, since this form of pulse has been noted repeatedly in experimental work when the lumen of the arteries had been diminished by administration of curare, by compression of the aorta, or by similar procedures. In another case which Jacob reports there was apparent contraction of the vessels of the trunk and limbs, while those of the face and neck were dilated; the thyroid, particularly, swelling during the attacks. The pulse-curve taken during the attack in this case showed further proof of the angiospastic origin, the secondary wave increasing to the level of the primary, and the primary sometimes almost or quite vanishing.

L. Feilchenfeld¹ describes a case in which **cardiac incompetency** came on soon **after protracted and violent laughter**. The trouble began with pain in the chest, dyspnea, and cough. These difficulties subsided, but were followed by unquiet sleep. Such attacks came on repeatedly, and were often accompanied by cyanosis, orthopnea, and very weak heart-action; the cardiac dulness became excessive, and a systolic murmur and reduplicated second pulmonary tone were found. These abnormal physical signs disappeared in about a week, and the attacks became much less frequent. The cardiac incompetency was believed to have been reflex, the laughing having caused spasmodic contraction of the diaphragm and some paresis of the vagus.

W. H. Dickinson,² in writing on the causes of dilatation of the heart, directs especial attention to his belief that **dilatation** arises through **distention during diastole** more than in any other way. For instance, it is produced in aortic regurgitation because the blood is poured into the heart while it is relaxed in diastole. The dilatation is much less in aortic obstruction because the distending force is active when the heart is firmly contracted.

L. d'A. de La Salle³ discusses the **heart-murmurs without valvular lesions** which are frequently observed during the course of eruptive fevers or in convalescence from these diseases. He finds that they are most common in females between 15 and 25 years of age, and that they are heard chiefly in those who are prostrated by the disease, and particularly when they have had cardiac weakness before. They have no especial value in prognosis as to the duration or termination of the disease. He does not consider that the murmurs are cardiopulmonary in origin; but, on the contrary, feels convinced that they are myocardial, and due to muscular or nerve weakness of the myocardium resulting from the toxemia. He has found that cardiac stimulants, particularly digitalis and caffeine, usually cause their disappearance; while vasodilators commonly increase their intensity.

H. Williams and H. D. Arnold⁴ report the results of their examinations of the **contestants in an amateur race** covering a distance of 25 miles. The pulse was increased from 20 to 48 beats after the race. The temperature was markedly depressed, in several instances going below 94° F., the lowest point registered by the thermometer used. In 6 cases examined, albumin and casts were noted after the race in each instance. The heart-dulness was widened, chiefly to the left, in 7 of 10

¹ Deutsch. med. Woch., July 28, 1898.

² Lancet, June 10, 1899.

³ Thèse de Paris, 1898-1899.

⁴ Phila. Med. Jour., June 3, 1899.

men examined, and 11 of 13 examined showed systolic murmurs after the race. These were considered mitral regurgitant murmurs. Sphygmograms showed marked decrease of the pulse-tension. The injurious results were considered to be due to the prolongation and strain of the contest, and demonstrate the necessity for careful examination of individuals before allowing them to indulge in severe athletic contests.

G. Altschul¹ has studied the **effects of bicycling** and of other sports upon heart-action. He learned that all forms of severe exertion caused the appearance of dilatation of the heart when the exertion had increased the respirations up to 28 or above. The pulse also became accelerated. This increase of heart-action causes the enlargement, which is at first physiologic, but may become permanent dilatation if carried too far. He thinks that bicycling is not essentially a dangerous exercise, but that more care is necessary in it than in mountain-climbing or turning, because subjective dyspnea does not appear so early, or, at any rate, is not so readily induced, and this is the danger-signal which commonly warns individuals to cease exertion. Bicycling should be restricted or forbidden in those who have disease of either the heart, the vessels, or the lungs; but in others, if it increase the appetite and does not cause subsequent languor and depression, it may well be continued. He believes it especially valuable in chronic constipation and obesity.

Schott,² in discussing the treatment of heart-disease in youthful subjects, reports the results of his examinations of normal individuals and others with heart-disease **after bicycle-riding**. The normal person showed in several instances marked irregularity of the pulse and enlargement of the heart-dulness. The sphygmographic tracings showed in some cases arrhythmia; in others, the recoil waves were entirely absent. The cases of compensated heart-disease showed similar but more pronounced changes.

A. Bianchi³ discusses the changes occurring in the heart after bicycle-riding, as established by the use of the **phonendoscope**. These consisted in enlargement of the heart, in some cases, after prolonged exercise; in others, both the heart and the lungs were smaller. The liver and spleen were elevated, and the pyloric region of the stomach also pushed upward, chiefly as a result of the position assumed in riding. Owing to his discovery of elevation of the abdominal organs, he suggests bicycle-riding as a sort of massage in the treatment of dry pleurisy.

F. Billings⁴ contributes a valuable paper on the **differentiation of cardiac incompetency** due to **intrinsic heart-disease** and that due to **chronic nephritis**. He first details the case of a man of 50, who showed dyspnea, weakness, and edema of the feet. There was no definite change in the heart, excepting some weakness; the urine contained albumin and a few hyaline casts, and the urea was decreased. After improvement there was again increase in the symptoms, and especially in the albumin and casts. There were no eye-changes. Later, thrombosis of the external jugular, axillary, and brachial veins appeared. The man again became better; but subsequently there was a heart-murmur and the heart enlarged, and death resulted during the existence of symptoms chiefly

¹ Münch. med. Woch., Dec. 6, 1898.

² Wien. med. Woch., Apr. 22 and 29, May 6, 1898.

³ Ibid., Dec. 24, 1898.

⁴ Jour. Am. Med. Assoc., July 6, 1898.

attributable to the heart. The postmortem showed fibrous myocarditis, with segmentation of the fibers, atheroma, and great narrowing of the coronary arteries. The kidneys were not severely affected. As to the diagnosis of this disease, Billings summarizes his views as follows: The case is probably of renal origin if the urine shows low specific gravity and contains much albumin, if the pulse is of high tension whether there is arteriosclerosis or not, if effusions contain urea and but little albumin, if there is a tendency to serous inflammation, morning nausea, headache, cerebral hemorrhage, attacks of epigastric pain, Cheyne-Stokes breathing, and if there are a puffy appearance, marked anemia, and changes in the eye-grounds. All these conditions, singly or combined, speak in favor of a primary change in the kidneys. On the other hand, if the history points to heart-disease, if the heart is irregular, if there are murmurs, if there is a soft pulse, if the anemia is slight or if there is none, if the liver is large, there is cyanosis upon exertion, the urine is scanty and has a high specific gravity and much deposit forms, if casts are few and chiefly hyaline, if there is a tendency to thrombosis, and if eye-changes are absent, the case is probably primarily cardiac.

L. F. Bishop¹ directs attention to the frequency with which weakness or **disease of the myocardium** acts as a cause of **prolonged convalescence** from disease. Undue rapidity of the pulse, feebleness of the cardiac impulse, and irregularity of heart-action should be especially looked for in convalescents; and if they are present, should be treated not by administration of muscle-stimulants, but by prolonged rest and full feeding, followed by slowly increased and carefully regulated exercise.

W. B. Cheadle and D. B. Lees² describe 3 cases in which there was extensive **venous thrombosis** associated with **rheumatic carditis**. In the first case, that of a girl of 14, who had had rheumatism shortly before, there was severe disease of the heart, which caused marked swelling of the left arm and death. At the autopsy there was found thrombosis of both internal jugular veins and both innominate veins, and of the upper portion of the superior vena cava. The second patient, a woman, 21 years of age, had previously had rheumatism, and when observed had disease of the heart. She complained of pain in the wrist and in the lower forearm. In this case there was thrombosis of the left internal jugular vein. The third case occurred in a girl, 9 years of age, who also had a rheumatic history. She died from cardiac disease, after presenting shortly before death swelling of the neck and tenderness on pressure over the neck. It was found postmortem that there was a thrombosis of the left internal thyroid, both innominate, both internal jugulars, both external jugulars, and of the axillary and subclavian veins on both sides. Microorganisms were absent from the clots.

Petrucchi³ reports a case of **Stokes-Adams disease**. The man had some time before had malaria and influenza. His first complaint was of prostration, a sense of constriction around the chest, and dimness of vision; but these symptoms passed off and allowed him to resume work. About a year later he had repeated syncope, sometimes accompanied by vomiting. The pulse often dropped to 14 to the minute, and after this period never went above 24. There was some emphysema, but no other

¹ Jour. Am. Med. Assoc., July 23, 1898.

² Lancet, July 23, 1898.

³ Gaz. degli Ospedali, Sept. 11, 1898.

signs were found. The patient died suddenly of syncope. The post-mortem showed atheroma of the carotids and coronary arteries, and chronic myocarditis without valvular disease. The medulla oblongata could not be examined. Cardiac tonics had been used, but they appeared to be ineffective.

C. D. Murray¹ describes a case of **bradycardia** which occurred in a man of 21. He had had increasing dyspnea and pain about the heart, with some enlargement of the dulness, and a slight systolic murmur and a slight diastolic murmur at the base. The pulse showed but 26 or 28 beats to the minute. Death occurred very suddenly, and the autopsy showed normal conditions of the valves, with marked **fatty infiltration** and perhaps some fatty degeneration of the muscle.

G. Freund² reports an interesting case in which there was no history of any of the diseases commonly involving the heart, but in which the postmortem examination showed a diffuse myocarditis and a general infiltration with polynuclear leukocytes; in certain areas there were small yellowish spots, which were evidently minute abscesses. In studying this and other cases he notes that **diffuse purulent myocarditis** usually affects the left ventricle, and in time involves the right ventricle as well, commonly leaving the auricles unaffected. There are no distinctive symptoms of the disease, though severe pain in the region of the heart is practically constant and to some degree characteristic, and most cases—as did this one—show severe nervous symptoms toward the end, death commonly occurring in stupor or coma. In this case there was an eosinophilia of 51%; but this was attributed to the presence of a *Tænia solium* in the intestine, which was accidentally discovered at the post-mortem.

Rupture of the Heart.—F. Duplant³ records a case of **rupture of the heart** which has the interesting history that the rupture had probably occurred at least 5 or 6 days before death, the fatal issue being postponed by the fact that a firm, fibrous clot had filled up the lumen of the perforation and had prevented the rapid escape of blood. The cause of the perforation, as determined postmortem, was excavation of the heart-walls from the breaking down of an old infarct. The clinical symptoms that the man had presented were pain of sharp character and of great intensity, which had lasted for 5 days before his admission, severe dyspnea, edema, and cyanosis, with enlargement of the cardiac dulness of the shape seen in pericardial effusion, diffusion of the impulse, and dull, irregular, obscure heart-sounds without murmur or gallop-rhythm, and associated with extreme weakness of the pulse. It was impossible to count the latter, and it sometimes disappeared entirely at the same time that the heart-sounds were noted to be particularly feeble. R. C. Newton⁴ reports a case of rupture of the heart which occurred in a man of 28, who was thrown violently from his bicycle and fell upon the broken post of the handle-bar. There was no penetration of the chest-wall, but the sixth costal cartilage was broken near the sternum, and postmortem examination showed that it had been driven into the apex of the right ventricle, and there was a laceration of triangular shape at that point, each limb measuring over 1 inch. The heart was otherwise normal.

¹ Lancet, Jan. 28, 1899.

³ Rev. de Méd., Oct. 10, 1898.

² Berlin. klin. Woch., Dec. 5, 1898.

⁴ Med. Rec., June 17, 1899.

J. Gordon¹ reports a case of **spontaneous rupture** of the heart, the result of obstruction of the coronary artery and consequent softening of the myocardium. The patient had survived the accident for a day and a half.

Aneurysm of the Heart.—A. Drasche² gives an extensive review of the literature upon **aneurysm of the heart-valves**, and reports 3 cases of his own. The first occurred in a woman of 66, whose local signs were an abnormal sound in the systole, which began softly and became groaning, a diastolic murmur, and at the base of the heart a loud postsystolic tone. The autopsy showed 3 small aneurysms of the lateral leaflet of the mitral valve, which were evidently of inflammatory origin. The second case occurred in a boy of 19, who showed systolic thrill and systolic murmur at the apex, and low murmurs at the aortic region, with a water-hammer pulse. In this case autopsy showed an imperforate septum and an aneurysm on the anterior leaflet of the mitral valve, the result of endocarditis. In the third case the signs had indicated stenosis and regurgitation at the mitral valve; while the autopsy showed 4 small aneurysms on the posterior leaflet of the mitral valve. These were thought to be due to excessive pressure of the blood-stream, owing to tightening of the chordæ tendineæ.

Thrombosis in the Heart-cavities.—B. van Sweringen³ records the case of a woman of 38, who presented no physical signs of valvular disease of the heart, but had the appearance of severe loss of compensation. She died from cardiac failure, and the autopsy showed a **pediculated thrombus** in the left auricle, which was so large and so situated as apparently to have entirely closed the mitral orifice.

Tumors of the Heart.—N. Raw⁴ discusses the case of a woman of 43, who had had for more than 3 years dyspnea and pain in the chest, the pain having recently become very severe. The dyspnea was intense and spasmodic; there was edema of the superficial veins of the thighs, abdomen, and thorax; the heart-action was regular, but there was a systolic murmur. The heart was displaced to the left; while the liver was displaced downward, and its edge was rough and nodular. Blood was withdrawn upon puncture of the right pleural cavity. The diagnosis of tumor of the right mediastinum or lung, and also of secondary growths in the liver, was made. At autopsy the right lung was found collapsed; while the inferior cava was empty, and the whole of the lower part of its course contained an organized thrombus in its upper third and was ruptured just before it entered the auricle. The **right auricle** contained a **tumor** 3 in. in diameter, firmly adhering to its wall and extending into the inferior cava so far as the under surface of the liver in the form of hard nodules, these growths, however, not being connected with the primary growth. Microscopic examination of the tumor showed that it was partially composed of fibrin, but largely of spindle-shaped cells; it was diagnosed as fibrosarcoma.

Treatment of Cardiac Disease.—T. L. Brunton,⁵ in discussing the use of remedies in diseases of the heart and bloodvessels, notes that in many cases valvular disease has no apparent influence in

¹ Brit. Med. Jour., May 6, 1899.

² Wien. klin. Woch., Nov. 10, 1898.

³ Phila. Med. Jour., May 20, 1899.

⁴ Brit. Med. Jour., Oct. 29, 1898.

⁵ Jour. Am. Med. Assoc., Oct. 8, 1898.

shortening life; and one great element in treatment is to **train the heart** up to the amount of work required of it. The training, however, must be carefully adapted to the condition of the heart. If the organ is very feeble the patient should be put entirely at rest, and in such cases massage is very useful. This should be followed by very gentle and gradually increased **resistance-exercises** and baths similar to the Schott baths. He considers digitalis and strophanthus unquestionably the most valuable drugs. These may be aided by strychnin if desired.

H. Beates¹ uses digitalin in the treatment of the vasomotor and **cardiac lesions of senility**, since he finds that, as a rule, the blood-tension is lowered rather than increased. He insists upon the necessity of administering from $\frac{1}{10}$ to $\frac{1}{2}$ gr. 3 to 6 times a day over a long period.

F. Winkler² has prepared a combination of **amyl nitrite** and **carbon dioxid**, saturating the amyl nitrite with the carbonic acid in order to introduce a small amount of the latter into the blood with the drug, and thus to attempt to prevent the formation of methemoglobin by preventing the combination of an excessive amount of oxygen with the hemoglobin. His investigations of the effects of this substance upon animals showed that it did not progressively decrease the blood-pressure, nor did it cause progressive paralysis of the heart, as does pure amyl nitrite; the first effect was a decrease in the power of the heart; but this was followed by a progressive increase to even beyond the normal point. The blood of animals poisoned by this substance did not contain methemoglobin, but was of a bright-red color. The animals showed no edema of the lungs, the diaphragm was not affected, and instead of the usual appearance of the heart in amyl-nitrite poisoning, the cardiac contractions became more powerful and effective, the left ventricle was found larger than the right, and the heart nearly equally dilated on both sides. Investigations upon his own person showed that the blood-pressure was less decreased than by amyl nitrite; this so-called *amylum nitrosum carbonisatum* did not have the violent effects of pure amyl nitrite; and there was none of the unpleasant symptoms resulting from the use of the pure drug, such as headache and fulness in the head.

F. S. Toogood³ finds **morphin** extremely valuable in those cases of heart-disease in which the pulse is very irritable and irregular, and there is much dyspnea and sleeplessness, together with decrease in the amount of urine and marked albuminuria. The usual cardiac remedies are often valueless in such cases, but morphin causes rapid improvement in many instances. [In cardiorenal cases with marked myocardial disorder we have found morphin often indispensable.]

J. Weiss⁴ has found **heroin** valuable in phthisis, primary bronchitis, and in bronchitis resulting from valvular heart-disease, and particularly insists upon its value in those cardiac cases that are not benefited by the ordinary remedies.

A. Rose⁵ discusses the uses of **carbonic-acid gas**. He finds this valuable in cases of disease of the lungs or heart, particularly in baths or as rectal injections. In the latter case he believes that through its ab-

¹ Therap. Gaz., Nov. 15, 1898.

² Zeit. f. klin. Med., Band 36, Hefte 1 u. 2.

³ Lancet, Nov. 26, 1898.

⁴ Die Heilk., Feb., 1899.

⁵ Med. News, Oct. 29 and Nov. 5, 1898.

sorption into the blood and traversing the lungs it causes increased diffusion of gases, thereby increasing pulmonary ventilation. He believes that it is useful in numerous other conditions.

Huchard¹ reports that his interne, Cantrui, has investigated the effect of **abdominal massage** in cardiac affections, and has found that it causes marked improvement, the effect being produced, it is believed, through the mechanical aid to the circulation and to the digestive organs, and through the skin-stimulation. The amount of urine has been noted in a number of cases to be markedly increased. In 1 case reported the total quantity went from 500 gm. up to 3000 gm., the pulse decreased, and the cardiac action became more forcible, while dyspnea almost disappeared.

Borgherini² describes a case, with severe edema due to cardiac disease, in which he used **incisions in the leg**, since medicinal treatment had not caused improvement and erysipelas had developed. The result was disappearance of the fever and recovery from the erysipelas, with improvement of the anasarca. Similarly satisfactory results were obtained in 3 additional cases, and the treatment is highly recommended.

C. L. Greene,³ in discussing the treatment of heart-disease by **saline baths and resistance-movements**, states that absolute adherence to the Schott method is not essential, but that the warmth and moisture and presence of salt in the baths are the important details. He has found the results best in cases of mitral disease; while the treatment is dangerous in cases of aneurysm, marked arteriosclerosis, myocarditis, and chronic nephritis. If the case is one of very severe loss of compensation, it should be treated at first by rest in bed and the usual remedies, and the Schott treatment should be begun only when improvement by other methods becomes unsatisfactory.

W. Edgecombe and W. Bain,⁴ in studying the effects of **baths, massage, and exercise** upon the arterial and venous blood-pressure, found that cold baths raise arterial pressure and lower venous pressure. The contrary conditions appear after reaction. Exercise during cold baths increases the rise in arterial pressure; warm baths lower both arterial and venous pressure; Turkish baths lower arterial pressure, and, to a less degree, venous pressure; saline baths lower arterial pressure to a greater extent than plain baths. During such baths the venous pressure is apparently lowered, but relatively raised. Dry massage lowers arterial pressure, but raises venous pressure; warmth, together with massage, increases these effects. The effect of exercise depends upon its severity. In all cases an initial rise occurs, succeeded by a fall if the exercise is mild; while if it is severe the rise continues. After exercise a fall occurs. The venous pressure rises during exercise, and continues high after the exercise is over.

H. B. Whitney⁵ records a case of valvular heart-disease in which an attack of extremely **acute edema of the lungs** came on, and seemed to be progressing toward a fatal termination in spite of active medication. The symptoms improved rapidly, however, after **venesection**, 12 oz.

¹ Bull. de l'Acad. de Méd., July 12, 1898.

² Deutsch. Arch. f. klin. Med., Band 61, Hefte 5 u. 6.

³ Jour. Am. Med. Assoc., Oct. 15, 1898.

⁴ Lancet, June 10, 1899.

⁵ Med. News, Dec. 3, 1898.

of blood being drawn. Comparative good health was regained. He uses this case as the basis of some remarks upon the value of venesection, and insists that its value is at present too little recognized by either profession or laity. He would limit its use, however, to cases that seem desperate, and particularly to cases of pulmonary edema due to sudden overstrain of the heart. [We should widen the extent of its use beyond that given by the author, particularly in heart-disease. In cases in which the right heart is seriously overloaded and the symptoms do not respond to medication, even though the condition has not been positively desperate, we have used venesection with striking results; the cyanosis, much of the dyspnea, and the evidence of congestion of the lungs disappearing, and the overdistention of the heart itself being almost immediately less marked.]

Tuffier¹ reports an extremely ingenious and somewhat startling method of **treating heart-failure**. The case was that of a young man, who had been operated upon 6 days before for appendicitis, and had done well through that time, when he had a sudden attack of syncope, with complete circulatory failure. Tuffier made an incision in the third intercostal space, went down to the heart, grasped the left ventricle between the thumb and index-finger, and compressed it rhythmically. Breathing reappeared for a few minutes, but the circulation grew worse again, and the procedure was repeated, with a second successful result; he sank once more, however, and this time died. A clot was found in the pulmonary artery.

CARDIAC NEUROSES.

K. F. Wenckebach² explains **irregular pulse** by attributing it to the occurrence of an extrasystole; that is, to a systole like that which occurs if the heart-muscle is irritated during the diastolic period, and which results in a contraction occurring earlier than the normal systole. Irritation during the normal systole will not produce a contraction; while in diastole irritation causes contraction, which is of a strength corresponding to the lateness of the period of diastole when the irritation is undertaken. Wenckebach supports this theory of the causation of irregular pulse by presenting a number of sphygmograms, which showed that the irregularity was in those cases an extra pulsation. In case intermission occurs, it is, he says, the result of an attempt at extrasystole, which is not sufficiently strong to produce pulsation in the arteries; and supports this statement by the observation that one may hear imperfect heart-sounds at the time of the intermissions when listening to the hearts of patients with intermittent pulses. This is 1 sound immediately following a normal heart-sound in case the pulse is intermittent; while if irregularities are noted in the pulse, there will be heard 2 sounds following the normal sounds, without any distinct pause between. He believes that both of these conditions are due to the production of an extrasystole, but that in one case it occurs so early in diastole that only a first sound is heard, and the contraction is too weak to expel sufficient blood into the aorta to produce a pulse and the second sound; while when 2 sounds are heard the contraction resembles the normal contraction, but is somewhat misplaced. Wenckebach

¹ Gaz. hebdom. de Méd. et de Chir., Nov. 10, 1898.

² Zeit. f. klin. Med., Band 36, Hefte 3 u. 4.

insists that all intermissions or irregular beats should be counted as true heart-beats.

J. M. Anders¹ describes 3 cases of unusual forms of **arrhythmia**. Two of them showed reduplication of both sounds, and the impression conveyed to the ear was that there were 4 sounds with each beat of the heart. One of these cases was apparently due to the excessive use of tobacco, and organic disease was absent; the other was an instance of exophthalmic goiter, and the double reduplication appeared only a few hours before death. The explanation given was a synchronous contraction of the ventricle. In the third case the heart went through a cycle similar to that observed in Cheyne-Stokes respiration.

J. Stitt-Thomson² describes a case which occurred in a man of 44, in which there were attacks of severe **bradycardia**, the pulse falling sometimes to 30, the condition being accompanied by dyspnea, cold extremities, and evident weakness of the circulation. The cause was believed to be gouty diathesis and exercise, and antilithemic remedies produced cure. Another case occurred in a young married woman, in whom irregularity of the pulse was noted, this disappearing during pregnancy, but returning after labor and persisting for years. There were no other abnormal signs or symptoms. The author considers *cactus grandiflorus* a very useful drug for such conditions.

A. J. Kinkead³ describes a case of **remarkably slow heart-action**. The man had been entirely well until he had a feeling of faintness. There were no abnormal signs excepting those found upon examining the heart, which was discovered to be contracting 3 times, these 3 beats being followed by a pulse of 10 seconds, the same cycle being constantly repeated. The next day the pulse had fallen to 6 beats to the minute, this number of beats being found unchanged during a continuous count for 1 hour. Swelling of the knees with pain appeared, but subsided upon the use of salicylates 24 hours afterward. The slow cardiac action by this time had become normal. Entire recovery occurred. W. E. Graham⁴ records a case of bradycardia in a man of 44. His pulse ranged from 30 to 40 per minute. In spite of an attack of tonsillitis, with the temperature at 102° F., the rapidity of the pulse did not increase.

W. Broadbent⁵ records 3 cases of **pulsus bisferiens** of the left side, the pulse in each instance on the right being that characteristic of aortic regurgitation. In the first case death occurred suddenly; the ventricles were found much hypertrophied and dilated, while there were aortic stenosis and regurgitation. There was marked atheroma of the aorta; but the subclavian arteries were normal. In the second case the double beat could be felt in the left carotid as well as in the left radial. In this case and in the third similar conditions were found in the heart.

Anacrotic tracings from the radials were obtained in these cases.

Angina Pectoris.—Schwartz⁶ has made a study of the **ganglion-cells** of the hearts of mammals. The study is of much possible importance in explaining the pathogenesis of angina pectoris. He carried on his investigations by using thionin as a stain, because it reacts with the ganglion-cells and not with the nerves, and thus any possible error from the latter

¹ Jour. Am. Med. Assoc., July 16, 1898.

² Dublin Jour. Med. Sci., July, 1898.

³ Brit. Med. Jour., Jan. 14, 1899.

⁴ Edinb. Med. Jour., Sept., 1898.

⁵ Canad. Pract., May, 1899.

⁶ Deutsch. med. Woch., July 28, 1898.

was excluded. He believes that previous investigators have mistaken other things for ganglion-cells, especially mast-cells, and decides that all the ganglion-cells are found within one small area, chiefly on the posterior side of the auricle, especially on the left side of the heart and directly about the coronary sinus, extending downward to the transverse coronary sulcus. The ganglion-cells are situated directly beneath the epicardium. [Owing to this position of the cells, they are very likely to be involved in cases of sclerosis of the coronary artery.]

C. D. Musgrove¹ describes a condition which he calls **writers' angina**. He gives it this name because it occurs only in those who are largely engaged in writing, and the attacks appear only while the individual is busily writing. The paroxysms resemble those of angina pectoris. He believes they are caused by the mental concentration, the cramped posture, and the interference of respiration owing to this posture; all these factors serving to cause temporary overstrain of the heart. He believes that the only difference between this and true angina is that the latter is due to permanent changes; while this writers' angina is due to a cause that is evident and may be removed. It is, however, dangerous in case cardiac disease already exists, or in those who are the subjects of marked arterial changes.

B. Addy² describes a case of angina pectoris which was very severe and had resisted other treatment, but was finally controlled by the use of $\frac{1}{2}$ gr. of **erythrol tetranitrate**.

B. O. Kinnear³ considers angina pectoris and many cases of palpitation of the heart due to **hyperemia** of the **spinal sensory centers**. He therefore treats those conditions by applying cold over the spinal cord and the sympathetic ganglia.

Exophthalmic Goiter.—Etiology.—C. Schwerdt⁴ devotes a good deal of space to the discussion of exophthalmic goiter and its **relationship to enteroptosis**. He suggests the fantastic theory that through disturbances of the lymph-stream exophthalmic goiter is produced by enteroptosis. In cases of general atony the chyle is, he believes, not carried properly along the thoracic duct, since the movements of the diaphragm are less effective; hence this lymph becomes mixed with that in the general circulation and seeks subcutaneous channels, the flow becomes disturbed, and stasis takes place, particularly in the orbit, thus producing the exophthalmos. The goiter he considers due to autointoxication from the intestinal tract, the thyroid overacting in the endeavor to neutralize the toxic substances absorbed.

A. G. Levy,⁵ after **experimental removal of the thyroid gland** in dogs, found that there was moderate anemia with distinct leukocytosis, the specific gravity of the blood and the proteid content being reduced; while the fibrin increased.

J. N. Coolidge⁶ reports a case of exophthalmic goiter, the symptoms of which appeared soon after an attack of **influenza**, with palpitation and dyspnea. These symptoms persisted for some time before tremor developed, and even then there was no exophthalmos and the thyroid was not enlarged.

¹ Lancet, Jan. 21, 1899.

³ Med. Rec., July 16, 1898.

⁵ Brit. Med. Jour., Sept. 3, 1898.

² Brit. Med. Jour., May 6, 1899.

⁴ Münch. med. Woch., Nov. 1, 1898.

⁶ Boston M. and S. Jour., Mar. 16, 1899.

Pathology.—Askanazy¹ reports an interesting study of the muscles from cases of exophthalmic goiter. He found in 4 cases severe involvement of practically the whole voluntary muscular system. The neuromuscular bundles usually showed the most severe involvement. The heart was commonly not fatty, but brown and atrophied. Askanazy believes that the muscular change was the result of toxemia, and thinks it explains the profound muscular weakness seen in many of these cases, and probably also the paresis, described by Charcot, which is sometimes observed. Perhaps the weakness of the ocular muscles allows of the protrusion of the eyeballs.

Symptomatology.—W. Hirschlaff² reports a very interesting case of exophthalmic goiter which ended fatally in the very brief period of 5 months. Beside the usual symptoms, which were present in severe degree, there was extensive brownish pigmentation of the skin and severe choreiform movements, and, particularly toward the end of the disease, there was fever, which just before death became marked. The postmortem showed adenoma of the thyroid, with hyperplasia of the thymus, the tonsils, and adenoid tissue of the stomach and intestines, with entire absence of evidence of infection. Interesting metabolic experiments are detailed, and it is shown that the woman took over a considerable period as much as 5300 calories a day, and of these it was calculated that 2700 calories were lost in respiration and in the energy expended in the severe muscular movements. Her respiratory interchange was 77% greater than that of a normal girl of about the same weight. Toward death the respiratory interchange increased very greatly, and Hirschlaff finds in this an **explanation of the fever**. He believes that with the variations in the amount of thyroid secretion there are corresponding alterations of oxidation and heat-elimination, but that at times the heat-production becomes so great that the heat-eliminative functions are insufficient, and that then the fever results; and if the eliminative mechanism becomes very insufficient, death occurs with marked hyperpyrexia. He believes that this case is striking evidence for the intoxication-theory of exophthalmic goiter.

Armaigniac³ presented a girl who showed marked **exophthalmos** of the **left eye alone**, with distinct tachycardia, tremor of the hands, and enlargement of the right lobe of the thyroid, together with general excessive nervousness. Von Graefe's sign was absent.

V. Miller⁴ gives a very brief report of a case of exophthalmic goiter in a young woman, in which the **eye-symptoms** were **unilateral**. The disease had existed but a short time. There were enlargement of the right lobe of the thyroid, marked tachycardia, and nervous excitability, and the right eye showed exophthalmos as well as Stellwag's and v. Graefe's signs.

Treatment.—Jeunet⁵ believes that **operation** should be undertaken in exophthalmic goiter if the symptoms, particularly the exophthalmos, are marked, and if other methods of treatment have been unsuccessful. He recommends section of the sympathetic, which should be done first on one side, and only some time later on the other.

¹ Deutsch. Arch. f. klin. Med.

² Zeit. f. klin. Med., Band 36, Hefte 3 u. 4.

³ Gaz. hebdom. de Méd. et de Chir., Nov. 17, 1898.

⁴ Brit. Med. Jour., Sept. 3, 1898.

⁵ Thèse de Paris, 1897-1898.

H. Bled¹ admits that good results often follow **section of the sympathetic**, but believes that there has been too indiscriminate use of the operation, and that it should be undertaken much more rarely than has been the case, since fatalities sometimes occur.

J. A. Booth² reports 8 cases of Graves's disease which were treated by **partial thyroidectomy**. One case was fatal—probably because of uremia; 1 was unimproved; 1 was improved so long as observed; and the remaining 5 seemed to have recovered entirely. Booth observed that this operation cannot be recommended as a routine-procedure, since it has a mortality of about 7%.

Weiller³ reports apparent entire cure of a case of exophthalmic goiter from the administration of **iodothylin** for about 3 months. The dose at first was about 3 eg. daily, subsequently increased to 75 eg.

Lépinos⁴ recommends the use of a 1% watery solution of **formal** for the preservation of **thyroid gland** which is to be used for therapeutic purposes.

R. Hutchison⁵ discusses the **pharmacologic action of the thyroid gland**, treating of its effect upon metabolism and circulation; of the excretion of the constituents of the gland; and, finally, of dosage. The effect upon metabolism is always stimulating, and it particularly causes marked increase of nitrogenous excretion. The uric acid and xanthin-bases show no definite change, and the increase of elimination is almost entirely in the form of urea. The larger part of the increase in nitrogen-excretion seems to be due to the breaking up of the proteids of the circulation; while the tissue-proteids are destroyed only after the fat has been much reduced. Thyroid causes increase in cell-activity, and in this way has a favorable influence upon imperfect growth in children and on certain skin-diseases, such as ichthyosis. The clinical phenomena produced by administration of thyroid are then discussed, and it is noted that neither iodothylin nor the colloid material produces the cardiac phenomena that follow ingestion of the gland; and it is therefore possible that the effect upon the heart is due chiefly to some product elaborated in the increased metabolism that follows the administration of the gland. Clinically there is a slight fall of blood-pressure after using the gland. This is probably due to enfeeblement of the heart-action. Large doses cause some destruction of the blood-corpuscles; though in myxedema thyroid apparently stimulates the growth of all cells, and in this condition the corpuscles increase in number. The excretion is chiefly through the kidneys. Hutchison does not favor the use of thyroglandin.

B. Bramwell⁶ reports that the administration of 2 5-gr. thyroid tablets daily to a woman who was nursing an infant 6 months old caused profuse sweating, vomiting, and sleeplessness in the child. When the thyroid was stopped the symptoms disappeared; renewal of the thyroid treatment caused a recurrence of the symptoms, and upon again stopping the administration of the gland the symptoms disappeared. The child therefore seemed to have acquired **thyroidism from the mother's milk**.

¹ Thèse de Paris, 1897-1898.

³ Presse méd., Aug. 27, 1898.

⁵ Brit. Med. Jour., July 16, 1898.

² Med. Rec., Aug. 13, 1898.

⁴ Bull. gén. de Thérap., p. 655, 1898.

⁶ Lancet, Mar. 18, 1899.

S. Solis-Cohen¹ has used the extract of **suprarenal gland** with good results in 4 cases of exophthalmic goiter.

W. H. Bates² reports marked improvement in a case of exophthalmic goiter following the use of **suprarenal gland**.

Mousin³ treated a case of exophthalmic goiter with **thymus gland**. There was much improvement in the tachycardia and exophthalmos as well as in the general condition. After the medication was stopped the symptoms all increased rapidly, but improved once more when the gland was ordered again.

R. Parker⁴ used extract of thymus in 4 cases of exophthalmic goiter with apparently uncertain and rather unsatisfactory results.

Pitres⁵ states that **hydrotherapy** has given him valuable results in many cases of exophthalmic goiter that were not very far advanced, but that the treatment which he had recently used seemed most effective. This consisted of making **injections of iodoform** into the thyroid gland, in order to cause its contraction.

Davezac⁶ reports good results from the treatment of a case of exophthalmic goiter by Pitres's method of injections of **iodoform in ether**. He notes, however, that the injections are very painful.

Debove⁷ records a case of cure of exophthalmic goiter by the **injection of tincture of iodin** into the thyroid gland. The injections were given 3 months after the disease appeared, and were continued for 10 months, and by this time all symptoms had vanished.

A. L. Gillespie⁸ had good results from the use of **iodin and bromid of strontium** in the treatment of exophthalmic goiter, especially in children. He thought the strontium salts might be more useful than sodium or potassium salts, because the metal is normally present in the body in, at most, excessively small amounts, and therefore its introduction might have more effect upon metabolism.

Paulesco⁹ uses **quinin** sulphate in continuous doses in the treatment of exophthalmic goiter, and reports good results, which he attributes to its action upon the vasoconstrictors of the vessels of the neck.

DISEASES OF THE ARTERIES.

G. Oliver¹⁰ describes a new **hemodynámometer**; this he considers more accurate than any other, because he uses a fluid pad instead of a solid pad, this being more delicate in registering changes in arterial pressure. In his investigations of arterial pressure he finds that when the influence of gravity is excluded the pressure is uniform in all arteries that can be observed. The pressure is decidedly reduced in the arterioles, but is not reduced in passage through the capillaries. It is probably slightly reduced in the venules. The normal peripheral resistance is mainly arteriolar. Gravity, posture, muscular exercise, respiration, temperature, and numerous other conditions have a notable influence upon blood-pressure. He notes the great increase that occurs from muscular

¹ Phila. Polyclinic, Sept. 17, 1898.

² Med. Rec., p. 516, 1898.

³ Compt. rend. de la Soc. de Biol., Mar. 25, 1899.

⁴ Brit. Med. Jour., Jan. 7, 1899.

⁵ Gaz. hebdom. de Méd. et de Chir., Nov. 17, 1898.

⁶ Ibid., Nov. 24, 1898.

⁷ Bull. de la Soc. méd. des Hôp., Apr. 21, 1899.

⁸ Brit. Med. Jour., Oct. 8, 1898.

⁹ Gaz. hebdom. de Méd. et de Chir., 1899.

¹⁰ Edinb. Med. Jour., July, Aug., and Sept., 1898.

exercise. This he has found is due to increase of blood in the peripheral vessels, the increase being shown by greater diameter of the limbs. Excitation of the blood-flow and increase in the heart-action also are active in its production. Blood-pressure often drops a little below normal after exercise; but it soon rises. [These results are at variance with results obtained by physiologic experiment.] Massage increases blood-pressure somewhat. Resisted exercises have the same effect as muscular exercises. Emotion and excitement cause increase; while fatigue produces loss of the general vasomotor control of the circulation in the various parts of the body, the blood tending to drain into the lower extremities and large abdominal veins if the body is erect, this being overcome by rest in horizontal positions. Rest really lowers the blood-pressure, but, what is more important, removes the effect of gravity.

W. Broadbent,¹ in a discussion on **vascular pressure**, drew attention to the fact that in many long-lived families the pulse-tension is low, and the longevity is due to the fact that there is less strain upon the heart and bloodvessels. High tension also is likely to be hereditary, commonly in association with diseases the result of or accompanying faulty metabolism, examples of which are gout and nephritis. In functional and nervous conditions, especially in neurasthenia, Broadbent considers the **pulse-tension** of extreme importance **in prognosis and treatment**. Cases with high tension are more favorable than the opposite, since they are usually dependent upon some intoxication that may frequently be eliminated. The same statement is true of epilepsy. High pressure is best treated by eliminants, the most important being some preparation of mercury; while low pressure needs cardiovascular tonics in many cases, and attention to the cause, which may be commonly found. In discussion, J. B. Bradbury spoke highly of erythrol tetranitrate for the treatment of high tension, and mentioned a case of uremia that was managed by the administration of this drug, and recovered from a grave condition; and another case, resembling Raynaud's disease, that also recovered under the use of this drug. D. W. Samways expressed his belief that there is **normally** an **excess of blood-tension**, and that the clinical importance of high tension is often overestimated. P. W. Williams emphasizes the fact that increased tension is probably intended for the purpose of eliminating toxic substances, and that the tension should be, as far as possible, let alone, and elimination be aided by eliminative drugs and proper diet.

P. Blot² has investigated 2 cases of **rheumatic arteritis** which came to autopsy, and found that the arterial trouble was due to emboli derived from the cardiac vegetations. He believes that it is not demonstrated that there is a distinctive rheumatic arteritis, and that probably most of the arterial complications are due to embolism. The prognosis is always grave.

T. J. Poynton³ describes 2 cases of **acute aortitis** associated with severe disease of the myocardium. The first patient, a woman of 38, had severe attacks of true angina. In one of them she died. The heart was not hypertrophied. There was slight mitral stenosis. The muscle was extremely degenerated; but the coronary arteries showed no marked alteration. In the aorta there was much swelling of the intima; the

¹ Brit. Med. Jour., Oct. 1, 1898.

² Thèse de Lyon, 1898-1899.

³ Lancet, May 20, 1899.

elastic coat in particular was densely infiltrated with leukocytes, and the muscle was much degenerated. No microorganisms were found. The second patient, a man of 63, also died of angina, and had similar conditions. The coronaries in this case also were apparently normal; while there was marked acute aortitis. He believes that there is evidence of the existence of a coincident affection of the heart and aorta; the involvement of the two not being dependent upon each other, but rather upon the same infection. This is very possibly syphilis; perhaps it is intoxication from alcoholism.

Cherchewsky¹ discusses a **new sign of aortic sclerosis**, which he describes as being elicited by tapping sharply over the aortic region with a percussion-hammer 5 to 10 times. In normal persons this causes the aorta to dilate, and the difference in the dullness can be determined. In cases of sclerosis no such enlargement of the dullness occurs.

Schrötter² gives a review of the literature upon **periarteritis nodosa**, and reports a case. He considers the affection to be multiple minute aneurysms, resulting from congenital weakness of the elastic tissue. The symptoms are rapid pulse, usually associated with fever; there are sweats, excessive thirst, localized edema, effusions into joints, pain, and marked chloranemia with cachexia. There is often paresis or paralysis, and the muscles are usually extremely tender. The disease may show symptoms referable principally to the nervous, the muscular, or the digestive system; or may affect chiefly the kidneys, or rarely the liver or lungs. It is most common between the ages of 20 and 30, and usually affects males; and it is likely to resemble miliary tuberculosis, septicemia, endocarditis, trichinosis, polymyositis, and multiple neuritis.

G. Freund³ reports an interesting case of **periarteritis nodosa** in which the postmortem disclosed large numbers of minute nodules widely scattered over the skin and peritoneum, particularly on the serous surface of the stomach and intestines. There were also many present on the other serous membranes, and the arterial changes were very marked in the muscles and along the nerves. To the changes in the arteries of the muscles he attributes the symptoms of peripheral neuritis during life. The patient had severe pains in the extremities and loss of power in them; later developing symptoms of failure of the respiratory muscles. The muscles of the extremities underwent marked atrophy, and late in the disease there were convulsions. There had been attacks also of constipation, with violent pains in the region of the stomach; and since cachexia was marked there was a suspicion of a neoplasm of the stomach. At times there was sugar in the urine, also. The author considers periarteritis nodosa the result of disease of the vasa vasorum. The gastric symptoms were evidently due to nodules on the serous membrane, which involved the nerves. Freund thinks that the occurrence of symptoms of peripheral neuritis and of involvement of the gastrointestinal tract, together with the discovery of small nodules beneath the skin, should lead to a diagnosis of periarteritis nodosa.

Heiligenthal⁴ records a very interesting case of **embolism of the abdominal aorta** which occurred in a woman, 48 years

¹ Sem. méd. No. 51, 1898.

² Wien. klin. Woch., Apr. 13, 1899.

³ Deutsch. Arch. f. klin. Med., vol. 62, Nos. 5 and 6.

⁴ Deutsch. med. Woch., Aug. 18, 1898.

of age, who had previously been treated for stenosis and insufficiency of the mitral valve. She was suddenly seized with severe pain in the legs, with paralysis, 10 days after her discharge, and was admitted in collapse; both legs were deeply cyanosed up to the hips, and there was livid discoloration of the abdomen in its lower part. Power of movement was entirely gone from the legs; there was no sensation, and pulsation could not be felt in the arteries. Death occurred a few hours later. At the bifurcation of the aorta there was a thrombus, 17 mm. in breadth, adherent to the vessels, and extending upward for 21 mm., and downward into both iliacs, on the right for 32 mm., on the left for 50 mm. There was no thrombus in the left heart that could have given rise to embolism. A consideration of the small number of cases of this condition previously reported shows that one of the most striking symptoms is usually reduction of the temperature of the lower extremities; this may drop even to 70° F. The diagnosis is usually comparatively easy, being differentiated from thrombosis by a more rapid onset of embolism, and by the fact that the collateral circulation is usually established in thrombosis. Embolism has occurred in 2 cases of aneurysm of the heart; in 3 in which thrombi had formed in the ventricle; in 2 with thrombosis of the auricle; and in 3 in which there was no thrombus-formation. In 17 instances it was seen associated with disease of the valves, without formation of thrombi. In 1 case a tumor was found compressing the pulmonary arteries and the aorta. The prognosis of the condition is almost absolutely bad. Paralysis has occurred repeatedly in this condition without changes being found in the spinal cord, and it is therefore probably due to ischemia.

F. A. Packard¹ reports the case of a woman of 62, with gout, who had embolism of the posterior tibial artery, resulting in gangrene of the foot, which necessitated amputation. The **embolism** was caused by a **calcareous plate**, probably coming from the descending thoracic or abdominal aorta, which was shown by subsequent postmortem to be in an advanced stage of atheroma.

R. Petch² records a remarkable case of **rupture of the aorta**. The prolongation of life was surprisingly great, death coming on after only 5 hours had passed subsequent to the rupture; while the autopsy showed that the aorta was completely ruptured $\frac{3}{4}$ in. above the valves, and the ascending portion was invaginated into the transverse portion as far as the beginning of the descending portion. There was a second invagination in the transverse portion, resulting from a second rupture of the walls of the artery.

Lumsden³ reported to the Academy of Medicine in Ireland a case of rupture of the first portion of the aorta in a woman of 23. It had occurred with great suddenness, and was found to be due to an apparently **spontaneous rupture**, since no severe lesions of the aorta were present. There were a few small areas of fatty degeneration.

¹ Va. Med. Semi-monthly, May 26, 1899.

² Lancet, July 9, 1898.

³ Brit. Med. Jour., Jan. 7, 1899.

ANEURYSM.

J. Calvert¹ discusses the relation of aortic aneurysm to **hypertrophy of the left ventricle**, and decides that there is practically no evidence that hypertrophy results from aortic aneurysm. W. S. Lazarus-Barlow, in discussion, said that in 13 cases examined after death there had been no hypertrophy. A number of others mentioned similar experiences.

D. Newman,² in discussing the early symptoms of **pressure upon the vagus** and recurrent laryngeal nerves, directs especial attention to the occurrence of sudden attacks of paroxysmal dyspnea with laryngeal stridor. There may be some alteration in the voice, chiefly in the form of impurity in its tone; and the voice becomes readily exhausted; while speaking at any length causes general exhaustion of the patient, because of the necessity for increased intrathoracic pressure in order to produce the proper vibration in the vocal cords, which, owing to the pressure upon the nerves, are very flaccid.

Steubel³ records a case of **unilateral delay of the pulse** with aortic aneurysm in which the cause was evidently due to narrow constriction of the left subclavian and the presence of the valve-like mass of fibrin over the opening of the artery, the valve causing obstruction with every systole. The subclavian also lay so close beneath the aneurysm that it was undoubtedly compressed whenever the sac was filled by the systole of the heart.

P. Renn⁴ describes a case of aneurysm that occurred in a man of 47, and in spite of its extent showed no characteristic signs until just before death. When admitted the individual showed marked dyspnea, and had had a severe chill, with violent pain in the left chest; there was evidently an effusion in the left pleura, the heart was pushed to the right; there was a slight murmur over the heart, and the second pulmonary sound was accentuated. Blood was withdrawn from the left pleura; after a second puncture, though some relief was obtained, the man died. The heart was found moderately enlarged and pushed to the right; there was about a gallon of blood in the left pleura; and in the anterior wall of the aorta there was an opening, below the level of the left bronchus, which led into a sac about the size of a hen's egg. This again opened into the posterior mediastinum and formed **a false sac**, which was bounded by the pericardium and the right and left mediastinal walls. Curiously, there had never been any previous history of dysphagia.

T. S. Short⁵ reports a case of aneurysm of the aorta which at no time caused pain, almost the sole symptom being a peculiar **paroxysmal cough**, not of the common brassy character of an aneurysmal cough. This was due to the fact that the aneurysm was so small and so situated that no symptoms except pressure on the trachea had been produced.

H. W. McLaughlin and W. N. Beggs⁶ describe a case of exceedingly large aneurysm of the transverse arch of the aorta which appeared as a **large external tumor** of the chest. The man, 52 years of age, had a syphilitic and alcoholic history, and presented cough, hoarseness, dyspnea, and a tumor reaching from the second to the seventh rib, and

¹ Brit. Med. Jour., Jan. 14, 1899.

³ Münch. med. Woch., No. 20, 1899.

⁵ Practitioner, Dec., 1898.

² Glasgow Med. Jour., Aug., 1898.

⁴ Med. Rec., Sept. 10, 1898.

⁶ Jour. Am. Med. Assoc., Aug. 6, 1898.

from the sternum to the midaxillary line on the left; pulsation and dullness were present. The whole of the left chest was flat on percussion, and there was no fremitus. The tumor increased progressively. There was some bleeding from the tumor just before death; but the termination of the disease was in a severe attack of dyspnea. There was found a false aneurysm external to the chest-wall; while the true sac arose from the transverse arch of the aorta, and was about 8 in. in circumference. The case was noteworthy because of the entire absence of pain.

H. G. Turney and C. A. Ballance¹ describe a curious case in which the diagnosis was impossible in the earlier stages. A man of 35 had excruciating pain in the back and upper abdomen. The back was rigid, and there was deformity over the seventh and eighth dorsal spines. Later there was some dysphagia, and suddenly **complete paraplegia** appeared. Laminectomy was performed, when the body of the seventh dorsal vertebra was found to be entirely gone and replaced by clot, into which a finger was passed without producing hemorrhage. Death occurred 10 hours later, and it was found that the finger had been passed directly into a clot in the sac of an aortic aneurysm without causing hemorrhage. The aneurysm had caused all the symptoms.

S. H. Berry² describes a case of **aneurysm** of the aorta, interesting because it was observed **in a boy** of 15, who died suddenly while playing cricket. There was no sign of syphilis, and history of severe overstrain or rheumatism was absent; but there was distinct atheroma of the aorta and a fusiform aneurysm of the ascending portion of the arch. The thymus gland was enlarged, being over 5 in. in length.

C. E. Beevor³ records a case of aneurysm of the abdominal aorta which was clinically interesting because the symptoms presented were such as to lead to a diagnosis of a **lesion** of the roots of the **lumbar plexus**. The patient presented numbness and deficiency of sensation on the anterior portion of the left thigh, decreased knee-jerks, weakness of the movements of the hip, tenderness over the last 2 lumbar spines, and in the left iliac fossa and the left lumbar region. There had been pain for 5 years in the region of the spine, and this had extended toward the hip in the few months preceding admission. Before death, however, there was found an expansile pulsating tumor on the left lumbar region. Death occurred suddenly; the retroperitoneal tissue was found so distended with recent blood-clot that the mass occupied almost the whole left side of the abdomen. The hemorrhage from the rupture had also hollowed out the psoas muscle, had ruptured the diaphragm near its posterior attachment on the left, and the left pleural cavity was filled with blood.

J. B. Coleman⁴ describes an interesting case of **dissecting aneurysm** which occurred in a man, 65 years old, who had lead-poisoning. The first symptom was agonizing pain in the lower part of the back and left hip, followed within 15 minutes by complete motor paralysis of both legs and anesthesia of the left leg. He vomited persistently. Next day the paralysis was almost gone, and the condition was thought to be spinal meningeal hemorrhage; but during the day the man was found dead a few moments after seeming entirely well. The postmortem disclosed a dissecting aneurysm, beginning at the level of the innominate artery and

¹ Brit. Med. Jour., Jan. 14, 1899.

³ Edinb. Med. Jour., Jan., 1899.

² Ibid., Dec. 10, 1898.

⁴ Lancet, Sept. 24, 1898.

extending down to the left femoral artery. This had ruptured, and a mass of blood had escaped into the right pleura. The paralysis was due to ischemia of the lumbar cord. T. N. Kelynaek¹ reports a case of dissecting aneurysm of the aorta which was discovered in a woman of 50 years, who had long been a rheumatic subject. Shortly before death she had severe dyspnea, became dropsical, the heart was very weak and irregular, and there was a systolic murmur. The autopsy disclosed mitral and aortic valve-disease, atheroma of the aorta and a dissecting aneurysm which began just beyond the left subclavian artery. This extended slightly upward, and downward as far as the bifurcation of the abdominal aorta. This case is the only instance of dissecting aneurysm seen in 1700 autopsies at the Manchester Royal Infirmary.

Treatment.—Lancereaux² presented 2 cases of aneurysm of the aorta which had been cured by **subcutaneous injections of gelatin solution**. In the first case there had been expansile pulsation and tumor. When shown, the man had neither localized nor expansile pulsation over the tumor. In the second case all pains and signs of compression had disappeared. The solution used was 2% gelatin in normal salt solution, and of this 250 cc. were given at intervals of 2 days to a fortnight, 10 to 20 injections commonly being sufficient for a cure. Huehard, in discussion, reported a case apparently entirely cured by this method. He had also employed it in the hemoptysis of phthisis, with arrest of the bleeding. He believed, however, that there was danger in the treatment from possible embolism. Lancereaux had learned of the occurrence of a sudden death in 1 patient, and counselled care in the use of the treatment, though he had never seen any accident himself.

L. Camos and E. Gley³ investigated in rabbits the question of the possible **increase of the coagulability of the blood** by intraperitoneal injection of gelatin. They found, however, in 3 trials that the coagulation-time was increased; and this they considered due to the fact that gelatin is not dialyzable, and must first undergo some digestion before it enters the blood.

Lancereaux⁴ expresses the belief that gelatin is actually soluble in artificial serum, and also that many substances that are not dialyzable may be absorbed. He believes that his experiments have shown that gelatin increases the coagulability of the blood, and that some of the solution injected into the peritoneal cavity disappeared therefrom in a few hours. Laborde, on the contrary, has found no evidence of absorption from the peritoneal cavity, but that some disappeared after a time owing to peptonization; and he attributes any action that it may have to its **conversion into peptone**. He has little faith in the usual methods of determining the coagulability of the blood. Hayem agrees with the latter statement, but thinks that nondialyzable substances may be absorbed, since the red blood-cells from dogs' blood may be found in the vessels of the goat after injection of dogs' blood into the peritoneal cavity of the goat.

P. Carnot⁵ thinks that there are **dangers in the subcutaneous use** of gelatin solutions for the purpose of increasing the coagulability

¹ Edinb. Med. Jour., Aug., 1898. ² Bull. de l'Acad. de Méd., Oct. 11, 1898.

³ Compt. rend. de la Soc. de Biol., Nov. 18, 1898.

⁴ Bull. de l'Acad. de Méd., Nov. 29, 1898.

⁵ Presse méd., Nov. 16, 1898.

of the blood, and that the hypodermic use of calcium chlorid is much safer. He finds gelatin solutions, locally applied, very valuable, however, and in cases of severe hemorrhage considers it allowable to use the subcutaneous injections. De Guy¹ finds that disagreeable symptoms are likely to result from the subcutaneous use of gelatin solutions; these are severe burning-pain, with a diffuse redness and marked induration of the subcutaneous tissue lasting some days.

R. Trémoclière² studies the **coagulants** of the blood that are of therapeutic value. He considers that the subcutaneous use of gelatin is dangerous, and since this substance cannot be given for coagulant purposes by the rectum or the stomach, owing to the digestive changes it undergoes, he thinks that, excepting in the most unusual circumstances, gelatin should not be used. He prefers calcium chlorid.

DISEASES OF THE RESPIRATORY TRACT.

General Considerations.—G. Killian³ has experimented upon the possibility of carrying out **direct inspection of the larger bronchi**. This he first attempted through a tracheotomy wound. After applying a solution of cocain, a tubular speculum was introduced and the patient's head kept well backward and slightly to the side. He was able to see the bifurcation of the trachea, and, pushing his instrument farther, it entered the right bronchus, and he saw the division into the main branches for the middle and lower lobes, the instrument at that time being at about the fourth intercostal space. About the same point was reached on the left. He was also successful in carrying out this procedure from above without tracheotomy, and found that the patient admitted of the presence of the instrument without showing any disturbance of respiration. The speculum was illuminated with a forehead-lamp. It is suggested that this may lead to some advances in the diagnosis, and perhaps the treatment, of diseases of the lungs.

E. Baelz⁴ especially recommends the use of a form of palpatory percussion which he terms **plessesthesia**. His method is to place the left middle finger firmly against the body-surface, then flexing the second, third, and fourth fingers of the right hand to an angle of 45 degrees, he brings them to within about 2 cm. of the left finger, percusses with 1 blow rather gently, and allows the percussing finger to remain against the other finger for a few seconds. It gives one a good idea of the amount of resistance. The method is also valuable in cases in which the blows of ordinary percussion cannot be borne because of the pain they give. He recommends immediate auscultation, rather than the use of a stethoscope, in examining the lungs.

R. C. Cabot⁵ has examined 220 cases in relation to **Litten's phenomenon**; 102 cases that had no disease of the chest showed an average excursion of $2\frac{1}{2}$ in. In 19 cases of pleurisy of various forms the shadow was absent on the side affected. It was almost entirely absent in 6 cases of emphysema, and was limited in 30 cases of phthisis. Obesity or muscular weakness may cause it to diminish, as will a large ascites. Cabot

¹ Jour. des Prat., Nov. 12, 1898.

² Thèse de Paris, 1898.

³ Münch. med. Woch., July 5, 1898.

⁴ Berlin. klin. Woch., Nov. 28, 1898.

⁵ Med. News, Apr. 15, 1899.

considers it a much more satisfactory method of examination than the x-rays. [Absence of the phenomenon is confirmatory evidence of disease of the chest; but large pericardial effusions, enlargement of the liver, and other factors lend too much confusion to admit of placing much confidence in it.]

A. H. Smith¹ describes a bell for the **binaural stethoscope**, which is made in the form of a flat, shallow cup, and is intended for introduction under patients who are gravely ill, in order that the posterior portions of the lungs may be ausculted without disturbing the patient.

W. K. Hunter² records the case of a child of 4 years, who had been through an attack of measles and developed tuberculosis of the lungs and, subsequently, symptoms of meningitis. The curious part of the case was that there were **Cheyne-Stokes respiration** and **rhythmic movements of the pupil**, which occurred at the same time as the respiratory changes; the arms also showed rhythmic tremors. The autopsy showed tuberculous meningitis; the exudate had considerably compressed the brain-convolutions, though microscopic changes were not found in either the cortex or the centers of the medulla.

DISEASES OF THE LARYNX.

L. Linkenheld³ reports 2 very interesting cases of a condition believed to be identical with that described by Charcot as *ictus laryngis*, or **laryngeal vertigo**, a condition which is believed to be the result of sudden stoppage of respiration from irritation of the superior laryngeal nerve. The cases reported in this paper occurred in old men who had arteriosclerosis, and in both instances the attacks came on after lighting a cigar, and began with severe cough, followed by a syncopal attack. In one case the man had just eaten a heavy dinner; and in the other the attack was preceded by emotional excitement. These factors and the irritation from tobacco-smoke were believed to cause the attack by irritation of the chronically sensitive mucous membrane of the larynx, the latter usually made so by tobacco-smoke. The reflex irritation of the vagus then caused slowing of the heart and cerebral anemia.

Bloch⁴ reports a case of what he considers **hysterical cough**, due to hysteria. The woman had coughed for several years, and the apices of both lungs showed tuberculous infiltration, and in 1 apex there was cavity-formation. Bacilli were present in the sputum. Besides the cough, there were at times attacks of intense dyspnea, and at one time there was apnea, for which artificial respiration had to be used. It was discovered that hysteric stigmata were present, and when the treatment was directed to this condition the patient improved, and eventually seemed to recover entirely from her tuberculosis. [Mere improvement upon general treatment and the existence of hysteric stigmata cannot convince one that the tuberculosis did not cause the cough.]

M. Collier⁵ had under his care a patient who for a long time had a peculiar, harsh, distressing cough that was almost incessant, but was

¹ Med. Rec., Apr. 1, 1899.

³ Deutsch. med. Woch., Oct. 13, 1898.

⁵ Lancet, May 13, 1899.

² Lancet, Mar. 25, 1899.

⁴ Ibid., July 21, 1898.

accompanied by no expectoration, fever, or signs in the chest. The cure of an **otitis media** cured the cough.

Uehermann¹ describes several forms of **rheumatism of the larynx**. These may occur, he says, as simple localized swelling of the mucous membrane, as injection and irritability of the mucous surface, as diffuse infiltrations, or as a definite nodose rheumatic laryngitis; there may also be a rheumatic edema. He has seen an intermittent double serous inflammation of the middle ear which alternated with rheumatism of the larynx, and thinks that both are rheumatic, and that rheumatism is a general infection that may localize itself in any portion of the organism. The condition with which nodose rheumatic laryngitis is likely to be confused is gumma, and the therapeutic test is often the only one that will decide the question. He reports cases in which these nodes disappeared under the use of salicylates alone. They are not swellings of the joints, he says, and they do not necessarily occur in connection with acute rheumatism, and the nodose form is not associated with catarrh of the larynx.

C. C. Rice,² after an elaborate study of 41 cases of **edema of the larynx** which he has found recorded during the past 12 years, decides that it is very doubtful whether edema of the larynx ever occurs from simple catarrhal inflammation, since in almost all the cases which had been reported as due to that cause he has found the record of some other local cause or of some constitutional disease to give rise to the condition. In one of his cases edema resulted from cankerization of a fibrous growth on the wall of the larynx; in another, from swallowing a piece of wood that lodged in the pyriform sinus.

DISEASES OF THE BRONCHI.

J. D  m  tre³ records 11 cases in which the **colon-bacillus** was determined to have been present with a fetid bronchitis or pleurisy. He discusses 15 cases collected from the literature. There is no definite disease of the lungs which this bacillus causes; it seems merely to produce a fetid condition of the sputa and breath. The intestinal origin of the infection is by no means evident in all the cases, and the bacillus seems in several instances probably to have penetrated through the mouth with the inspired air.

J. Seitz⁴ records 4 cases of acute bronchitis that were followed within a few days by **nephritis**; the same organisms (staphylococci and streptococci) that had been discovered in the mucus from the respiratory passages being found in the urine. He thinks that the **bronchial infection** caused the nephritis.

A. Hints⁵ describes a case of **membranous bronchitis** associated with mitral insufficiency. He does not consider the bronchitis secondary to the heart-disease, since the latter persisted without much improvement; while the bronchitis was practically cured, and 2 years after the patient died of loss of cardiac compensation. [We have seen very marked membranous bronchitis in valvular heart-disease.]

¹ Centralbl. f. innere Med., Oct. 1, 1898.

² N. Y. Med. Jour., Dec. 3, 1898.

³ Th  se de Paris, 1899.

⁴ Sem. m  d., Dec. 28, 1898.

⁵ Wien. med. Woch., Oct. 15, 1898.

J. Lépine¹ records a case of chronic pseudomembranous bronchitis which was completely cured within a month by the use of alkaline treatment and absolute milk-diet. The man, 40 years of age, was of a very nervous temperament, and had had chorea and rheumatic pains. The pseudomembranous bronchitis had been preceded by numerous attacks of simple acute bronchitis and 1 attack of pneumonia. Since all other treatment had been ineffectual, Lépine was led to treat the case as dependent upon the "**rheumatic diathesis.**" He states that this is the first time that such a cause of the condition has been noted.

H. B. Whitney² gives the history and postmortem findings in an unusual case of **bronchiectasis**. The man developed sudden signs of cavity in the upper part of the lower lobe of the left lung, and this was thought to be bronchiectasis. He improved remarkably, however, and the trouble had apparently disappeared, when suddenly, several months later, he developed signs of the same character in the lower anterior portion of the right lung, and these signs persisted. Postmortem it was discovered that there had been a bronchiectasis of the left side, which had thin walls; this was wholly empty, entirely collapsed, and seemingly practically cured. Whitney emphasizes the interest of the acute onset in this case, but at the same time states that the postmortem appearances showed that the condition was old, and that evidently the bronchiectasis on either side had been latent for a long period, and had suddenly given rise to symptoms owing to an acute inflammatory attack.

N. Pitt³ records the case of a woman of 26, who had bronchiectasis and attacks of severe dyspnea. The **temperature** was always found **higher in the left axilla** than in the right, the difference amounting sometimes to 4° F., and the temperature rising to 110°, 114° F., and even higher; during these attacks the woman was exceedingly prostrated. The clue to the condition seems to be furnished by the fact that when the temperature in the left axilla was at one time observed to be 109.7° F., that in the mouth was but 99.4° F., and the speakers who discussed the question would seem to be right when they considered it probably trickery. Pitt does not assent to this view, however; and B. Thorne described a case of very erratic temperature which sometimes reached 104° F., the fever being associated with asthmatic attacks; the curious fact is noted that on one day the cardiac apex-beat was found beneath the right nipple, while on the next day it was found in its normal position.

Treatment.—F. Miodowski⁴ reports the case of a man, 65 years old, who was ordered 20 drops of **Hydrastis canadensis** 3 times a day for bronchitis. After the second dose he showed violent poisoning, with evidences of edema of the lungs, heart-weakness, and cyanosis, with very weak pulse. Stimulants brought about entire recovery. The man had no evidence of heart-disease.

Clozier,⁵ in a case of widespread bronchitis with evidences of bronchopneumonia, in which there were numerous streptococci in the sputum, administered **antistreptococcic serum** repeatedly. Within a week the condition was so improved that the injections were stopped, and 2 weeks later the patient was discharged.

¹ Rev. de Méd., Oct. 10, 1898.

² Boston M. and S. Jour., Dec. 22, 1898.

³ Brit. Med. Jour., Nov. 19, 1898.

⁴ Berlin. klin. Woch., Jan. 30, 1899.

⁵ Bull. de l'Acad. de Méd., Aug. 16, 1898.

PNEUMONIA.

General Considerations.—Hutchinson¹ reports his careful work on the **chlorid-metabolism** in pneumonia and acute fevers, and gives an extensive review of the literature, with the following statements: During acute lobar pneumonia the chlorids in the urine are greatly diminished and may disappear. Metabolism-experiments show that this is due to retention, the retained amount averaging about 2 gm. per day. This retention persists until a day or two after the crisis, when it is succeeded by excessive excretion. The amount of retention bears no direct relation to the degree of fever or the amount of lung involved, or to the presence and degree of albuminuria. The other solid constituents of the urine are not diminished in pneumonia. Diminution of the chlorids occurs in other diseases, and is therefore not pathognomonic of pneumonia; but it is most constant and occurs to a much greater extent in pneumonia, and is therefore of diagnostic value, particularly in relation to other diseases of the lungs. The absorption of chlorids during acute fevers is normal, and there is no vicarious excretion. The amount secreted in the saliva in pneumonia is relatively large; but in daily amount absolutely small. The amount contained in the exudate is not sufficient to account for more than one-third to one-half of the total amount retained during the course of pneumonia. The retention does not seem to be due to lack of excretory power of the kidney, since similar retention does not occur in cases even of acute nephritis. The chlorids are diminished in the blood in pneumonia. They do not seem to accumulate in any special organ, but all the tissues seem to contain a somewhat greater amount than normal. The reason for this passage from the blood into the fixed tissues is not yet explained. Hutchinson believes that it is probably due to the primary exudation of water.

Carrière² gives the details of 16 cases of **acute idiopathic congestion** of the lungs (Woillez's disease) that have come under his observation. The condition, as he describes it, is an acute affection, commonly appearing after exposure to cold or the occurrence of an injury to the chest. It begins with rapid rise of temperature, sometimes to 104° F., severe pain in the side, and dyspnea. The fever persists, as does the dyspnea; the pain remains sharp and continuous, and grows worse by paroxysms, but has a peculiar tendency to be felt upon either the affected or the well side. It may at times form almost a girdle-pain. There is a variable amount of cough, and usually expectoration of a substance that is somewhat viscid and often blood-tinged, and in its general consistency appears like glycerin. The sputum, in his experience, contained staphylococci most frequently, sometimes streptococci, and in several instances diplococci. Puncture of the lung yielded staphylococci in 3 instances, and in 2 of these cases they were associated with pneumococci. The physical examination of the thorax shows increase of volume of the affected side, with limitation of movement or immobility on this side. Fremitus is decreased, but is not absent. There is slight dulness on percussion. The expiration is prolonged; the murmur soft and obscure, as a rule; though it may be rough or puerile, and is frequently of cog-wheel type, and quite commonly blowing. This blowing

¹ Jour. Path. and Bact., p. 406, 1898.² Rev. de Méd., Oct. and Dec., 1898.

expiration, as well as the pain, tends to be present first in one place and then in another. A crepitant rale is usually heard, and subcrepitant and moist rales are common. Egophony is noted exceptionally; but the symptom described by Woillez, and designated by Carrière as echophony, is usually present. This consists of the occurrence of a short sound which follows the vocal resonance and resembles an echo of the voice-sound. He describes the temperature-course of Woillez's disease as consisting of a rapid rise followed by a continuous course, with moderate remissions for 3 or 5 days, and ending by a very rapid crisis. The leukocytes during this time are often increased to beyond 20,000 per cmm.; and at the time of the crisis there is marked eosinophilia. The liver is nearly always enlarged from congestion; while the spleen remains of normal size. The urine is decreased during the course; but with the crisis there is a critical polyuria. The phosphates and chlorids, which are markedly decreased during the continuance of the fever, become very abundant with defervescence. Small quantities of albumin are frequently found. The urinary toxicity, which becomes notably diminished during the course of the fever, is found excessive at the time of defervescence. The outcome of the disease is practically always in recovery. The diagnosis from intercostal neuralgia and pleurodynia is at first slightly difficult, but is readily made by the fever, dyspnea, and abnormal pulmonary signs. Bronchitis is eliminated by the very abrupt onset with chill, severe pain, marked dyspnea, the brief course, the gelatinous expectoration, and the rapid crisis. Acute pneumonia has an onset of greater gravity, though with rather less pain and dyspnea; the expectoration is viscid; crepitant rales are heard, while they are rare in Woillez's disease; there is bronchial breathing, and the disease has a longer and graver course. Pleurisy does not exhibit this abundant gelatinous expectoration, nor the rales, and there are signs of actual pleural effusion. In 1 case that resulted fatally on the sixteenth day the lungs were found enlarged, congested, and heavier than normal, and in portions were partially infiltrated, though they did not sink in water. Microscopic examination showed that the alveoli in these areas were largely filled with red blood-cells, de-quamated epithelial cells, and leukocytes; of the latter, an exceedingly large number contained eosinophilic granulations, while the remainder were chiefly mastzellen. There were numerous areas of lobular emphysema surrounding these partially infiltrated areas. The treatment consisted in venesection if the individual were robust, and counterirritation and expectant methods. [Notwithstanding the views of this writer and others, the existence of an independent disease corresponding to the above description may be doubted. Some of the cases are doubtless irregular forms of pneumonia; others cases of general septic infection.]

A. A. Smith¹ records his notes of 60 hospital cases of **lobar pneumonia**. The general mortality was 28½%. The entire absence of empyema as a sequel is noteworthy. In 12 cases the disease was of the apex, and 5 of these were fatal; 29 cases had disease in but 1 lower lobe or in the middle lobe alone, and but 7 of these were fatal. In the treatment he notes that compresses reduced the temperature and quieted the pulse as well as the nervous system. The effect of the compresses seemed

¹ Med. News, Dec. 24, 1893.

to be quite as evident when used over the abdomen as when placed over the chest.

Donier,¹ in studying the question of the **relation of high temperature to prognosis** in pneumonia, concludes that a high temperature is often of good prognosis; while frequently a low temperature indicates an unfortunate termination. The most important point to be observed is the relation between the temperature and the pulse. If the temperature is high and the pulse low, it indicates a good reaction; while if the pulse becomes excessively rapid, a high temperature is of bad omen.

L. Beco² made **cultures from the blood** in 29 cases of pneumonia that recovered and in 20 fatal cases. Of the former group all but 2 instances were sterile; in these, only isolated pneumococci were found. In 5 of the fatal cases pneumococci were found in large numbers; in the others they were absent. He decides that pneumonia is usually a local infection of the lung, but that sometimes the pneumococci escape into the circulation and multiply there, causing **fatal septicemia**. The discovery of isolated pneumococci in the blood is of no prognostic importance; but if many are found, the prognosis at once becomes exceedingly grave. He records 1 case of pneumonia, due to the bacillus of Friedländer, in which there was a general bacillemia.

C. Pope³ investigated the **excretion of xanthin-bases**, uric acid, and total nitrogen in 1 case of typhoid fever and in 5 of pneumonia. The conditions in the case of typhoid fever were about normal. In the 5 cases of pneumonia there was during the disease always an increase of the alloxur-bodies; but this occurred practically always at the time of the disappearance of the leukocytosis, and was associated with increase of the total nitrogen, the increase of both xanthin-bases and total nitrogen being attributed to the absorption of the exudate and of the nucleins and proteids contained therein. There was no increase of xanthin-bases at the time of the hypoleukocytosis. Pope states that the amount of xanthin-bases excreted varies but little in the same individual when taking a constant diet. [This is contrary to Taylor's wider experience. Pope's tables showed variations of less than 20 mg. in 4 cases of pneumonia. Taylor's experience would indicate that this was within the normal limits, though it is noteworthy that the increase occurred in each case at the particular period mentioned.]

R. Van Santvoord,⁴ in order to determine the **condition of the vasomotors** in lobar pneumonia, made pulse-tracings, and found that the primary wave was generally high and sharply pointed, with little indication of a tidal wave; while the dicrotic wave was variable. The pulse was often large and bounding, but the tension was low, a false feeling of tension being given by the bounding character of the pulse; he therefore concluded that the tension in lobar pneumonia is usually low, and that the vasomotors are relaxed. The conclusion justified, he believes, the experimental work done on animals; he has therefore attempted to increase the pressure by using barium chlorid, but the results were unsatisfactory. Ergot was more useful; but strychnin was usually best.

Lop and Monteux⁵ report an **epidemic of pneumonia** which con-

¹ Thèse de Lyon, 1898.

² Rev. de Méd., June 10, 1899.

³ Centralbl. f. innere Med., June 24, 1898.

⁴ N. Y. Med. Jour., Oct., 1898.

⁵ Bull. de l'Acad. de Méd., Sept. 6, 1898.

sisted of 25 cases of bronchopneumonia that ran a typhoid course, and of which 11 were fatal. The cases all arose within a small radius of territory, chiefly in 3 houses. The people attacked by the disease lived under exceedingly poor hygienic surroundings, were overworked, and poorly fed. The authors believe that the spread of the disease was undoubtedly through contagion by means of the sputum.

P. J. Hamilton¹ observed 9 cases of pneumonia in persons in early adult life, who lived near each other. The cases had similar onset and course, and all were severe. Since the sanitary surroundings were bad, Hamilton is inclined to believe that the epidemic-like outbreak was due to a **common source of infection**.

W. Kolle² notes that certain writers have claimed that **pneumonia in negroes** in South Africa is different from the form met with in whites. He has made examination of the sputum from cases of pneumonia in negroes, and found that in 18 specimens the pneumococcus was present 16 times; the influenza-bacillus twice; the cultures obtained from 15 lungs showed the diplococcus in 11 instances, the influenza-bacillus 4 times; therefore, it is probable that the cause is the same as in whites. The mortality was high, usually between 60% and 70%.

E. Bloch³ reports a case of **contusion-pneumonia**. A man, 41 years of age, fell, striking the lower portion of his right chest; the next day he had signs of pneumonia of the lower right lobe. There was crisis on the fourth day. The initial chill had been absent. It is possible, however, that the pneumonia and trauma were simply coincidences. There was no probable rupture of the lung-tissue, since bloody sputum was absent. If the trauma caused the pneumonia, it probably did it by compression of the lung, causing moderate injury, and thus giving opportunity for invasion of the pneumococcus.

Pézerat,⁴ in a general review of the question of **traumatic pneumonia**, recognizes the importance of traumatism as a cause of acute consolidation of the lung, and says that the cases are likely to be very irregular, particularly in their onset, which is often slow and accompanied by obscure signs. Their irregularity clinically is explained by the lesions found postmortem, which may be of the character of lobar pneumonia, localized areas of catarrhal pneumonia, or sometimes an interstitial thickening of the lung.

Sabelotnow⁵ reports that in a case of pneumonia following operation for strangulated hernia the **Bacillus coli communis** was found to be the only microorganism present in the affected portion of the lung, and, therefore, was considered the cause of the pneumonia.

D. Drummond⁶ records some cases of **ether-pneumonia**, in 2 of which he made postmortem examinations. He claims that many pneumonias that are called septic are due to ether. The postmortem findings in either case are similar, consisting of a catarrhal pneumonia of greater or less extent. The ether causes a violent irritation that predisposes to infection of the lungs by bacteria; so that pneumonia is, he insists, in many cases due to ether when it is called septic. J. M. Anders,⁷ in dis-

¹ Brit. Med. Jour., May 20, 1899.

² Deutsch. med. Woch., July 7, 1898.

³ Münch. med. Woch., July 26, 1898.

⁴ Gaz. hebdom. de Méd. et de Chir., 1898.

⁵ Medicinskoje Obosrenje, Band 60, Heft 6.

⁶ Brit. Med. Jour., Oct. 1, 1898.

⁷ Univ. Med. Mag., Aug., 1898.

cussing the same subject, reports that from the statistics of 12,842 etherizations he collected 30 cases of ether-pneumonia, of which 13 were fatal. He believes that the cause of this condition is probably **inspiration of mucus** from the nose and throat, and advises care in cleansing the nasopharynx and mouth before operation, and watchfulness during operation to prevent inspiration of mucus.

H. Brunner¹ presents elaborate tables to show the effect of the **gravitation of the moon** in increasing the occurrence of pneumonia and in bringing on the crisis, and suggests that possibly this may be due to increased activity of the microorganisms resulting from the meteorologic conditions.

T. J. Mays² considers that pneumonia is chiefly the result of **disturbance of the nerve-supply** of the lungs.

Symptoms and Complications.—R. Lépine³ describes 2 cases which began with symptoms of pneumonia and developed some dullness with collections of rales, and would commonly be called instances of **central pneumonia**, since they ran the typical course, but never developed positive signs of consolidation. Examination with the x-rays, however, showed that there was no abnormal shadow over the supposedly consolidated area; and, therefore, Lépine reaches the conclusion that these cases and many similar ones are probably not pneumonia at all, but severe congestion of the lungs.

A. Abrams⁴ describes 2 forms of **bronchopneumonia** that are not commonly recognized, calling them the nonfebrile form and the septic form. He reports 61 cases of bronchopneumonia, among which he found 25 which were tuberculous, 10 simple, 15 chronic febrile cases, and 11 septic. The septic cases showed the signs of sepsis, and had purulent expectoration, night-sweats, and chills; in this form pus-cocci, colon-bacilli, and pneumococci were found. This variety resembles the tuberculous very closely, but is of favorable prognosis. Abrams especially recommends the inhalation of compressed air and the use of potassium iodid.

T. F. Raven⁵ describes a case of pneumonia that occurred in a boy of 12, in which the crisis seemed to be coming on on the seventh day; but his condition afterward became much worse and delirium appeared, although the signs of consolidation vanished. Finally improvement occurred; but on the nineteenth day there was paroxysmal cough, with chills and sweats and dislocation of the heart. The latter signs were believed to be due to **suppuration of the bronchial glands**, and expectoration of pus in considerable amount is believed to have established this diagnosis. The author is convinced that the inflammation of the lungs is benign of itself, and is for the purpose of eliminating toxic materials; and he thinks that the early cessation of inflammation in this case caused intoxication of the boy's system by means of the early cessation of the exudate in his lung. He insists that ice-bags should not be used for the purpose of controlling inflammation of the lung, as they may be harmful by causing too rapid subsidence of the inflammation.

J. A. Lindsay⁶ reports a case of **fatal nonfebrile pneumonia**

¹ Deutsch. Arch. f. klin. Med., vol. 62, 1899.

² N. Y. Med. Jour., Dec. 31, 1898.

³ Rev. de Méd., May, 1899.

⁴ Med. News, Sept. 24, 1898.

⁵ Practitioner, Sept., 1898.

⁶ Dublin Jour. Med. Sci., Apr., 1899.

that occurred in a man of 38, who was of very intemperate habits. The temperature was below 99° F. until just before death, when it rose to 101° F.

H. Sello¹ reports the results of his study of 750 cases of pneumonia, with particular reference to the **complications and sequels**. Abscess-formation occurred in 1.5% of these cases, and was indicated by continuance of the fever, slow absorption of the exudate, and a peculiar thick, homogeneous character of the sputum. In 1 case abscess formed and death occurred within 7 days of the beginning of the pneumonia. The lung in this case was riddled with small abscesses, of which there had been no sign during life. In the 11 cases complicated with abscess the sputum contained fragments of lung-tissue in but 3 instances. Only 3 examples of gangrene were found in the records of these 750 cases. The most important symptom noted in the early stages of gangrene was a peculiar chocolate color of the sputum, which was noted almost always before the breath became foul. Induration occurred in 16 of the cases, and tuberculosis was present 15 times. In none of the latter cases did the tuberculosis seem to have originated in the pneumonia; but was in all instances apparently the older trouble. Serous pleurisy was present 65 times, empyema 34 times; 26 of the latter were examined bacteriologically, and in 19 instances the pneumococcus was found, 4 times combined with streptococci. The latter cocci and staphylococci were found in the other cases. Of the empyemas, 14 resulted fatally. Purulent mediastinitis occurred 3 times; all the cases were fatal, and in all the pneumococcus was found in the pus. Pericarditis was seen in 7 cases; in 2 purulent cases pneumococci were found. In 48 cases of the whole series bacteriologic examinations of the blood were made; in 36 instances these were negative, in 12 positive. Of the positive cases, but 2 recovered; of the negative cases, 27 recovered and 9 died. Of these 9, 4 were double pneumonias; and of the remaining 5, 4 were alcoholics and 1 occurred in an aged woman. Endocarditis was seen 6 times. In 5 of these cases bacteriologic examination of the exudate upon the valves was undertaken, and in 3 cases the pneumococcus was found. Four of these 6 cases were of the verrucose form. Acute nephritis was noted in 6 cases; these including only those instances that had a large amount of albumin, blood, cellular elements, and casts in the urine. Purulent meningitis was seen 5 times; in each of these cases the exudate contained pneumococci.

Gilbert and Grenet² believe that the **icterus** often observed in pneumonia is due to an angiocholitis caused by the *Bacterium coli commune*. In 3 cases of pneumonia in which icterus had been present they found this organism in the bile; while in other cases that had no icterus the bile was sterile. They think that icterus is much more likely to occur in pneumonia in cases that have some affection of the liver, especially in those addicted to alcohol.

A. Grenet³ discusses the **liver in pneumonia**, particularly pointing out the gravity that pneumonia exhibits in the subjects of hepatic disease, the mortality of the disease being increased; in case recovery occurs the convalescence is prolonged and unsatisfactory. Pneumonia does not cause specific lesions in the liver, and there is little reason to think that a

¹ Zeit. f. klin. Med., Band 36, Hefte 1 u. 2.

² Arch. gén de Méd., Feb., 1899.

³ Thèse de Paris, 1899.

descending infection of the biliary passages by the pneumococcus occurs and gives rise to the jaundice that is frequent in pneumonia. This jaundice is probably due to a catarrhal infection of the biliary passages from various causes, and it is more likely to occur in those who have already some disease of the liver.

Gilbert and Grenet¹ investigated the **limits of the liver** in 48 cases of pneumonia. In 38 adults the organ reached below the edge of the ribs 10 times; 8 times so much as 5 cm. In 6 children the liver was enlarged; in 4 aged patients it was normal. If enlargement of the liver occurs in pneumonia, it appears at the height of the disease, and the liver grows smaller during convalescence.

C. J. Aldrich² describes a case of pneumonia in which severe **hic-cough**, which persisted for 5 days, complicated recovery. There was also the appearance of obstruction to the outflow of bile. The administration of calomel caused disappearance of the hepatic signs and of the hiccough; but soon after there appeared pain and muscular weakness in the right shoulder and arm, and atrophy of the muscles ensued—signs of neuritis of the brachial plexus. The hiccough was believed to be due to inflammation of the phrenic nerve. In another case of pneumonia convalescence was complicated by parotitis.

H. Roger³ reports a case of pneumonia in which the **temperature reached 109.4° F.**, but recovery ensued.

W. R. Ramsey⁴ reports a case of **central migrating pneumonia** which involved successively all 5 lobes of the lungs.

Bernheim⁵ reports 2 cases of **abscess due to the pneumococcus**. One case, which was of much interest, was that of a man, 50 years old, who was admitted with the symptoms of typhoid fever. He had been sick 1 month. The autopsy showed a pneumonia of the upper lobe of the right lung; while the 2 lower lobes were transformed into a large abscess-cavity, the pus of the abscess containing pneumococci only. There was suppurative meningitis.

J. M. DaCosta⁶ reports 3 cases of **phlegmasia alba dolens** complicating pneumonia, and collects 6 others from the literature. Of these, 5 were on the left, 2 on the right, and 2 were bilateral.

A. V. M. Anderson⁷ records a case of lobar pneumonia of the wandering form which was complicated by a **streptococcus-abscess of the elbow**, by thrombosis of the left femoral vein, and finally by arterial thrombosis in both legs, causing death.

Treatment.—A Fränkel⁸ records his experience in the use of **large doses of digitalis** in the treatment of pneumonia. He does not give the immense doses recommended by some authors, limiting himself to at most 1 dr. a day. He uses this treatment only in the early stages of the disease, because about the time of the crisis digitalis is likely to cause bradycardia and irregularity of the pulse. He also excludes cases that show distinct cardiac weakness, as they are not likely to stand the treatment. He observed progressive fall of the temperature and pulse,

¹ Compt. rend. de la Soc. de Biol., Dec. 24, 1898.

² Med. News, Nov. 5, 1898.

³ Rev. de Méd., May, 1899.

⁴ Northwestern Lancet, Feb. 15, 1899.

⁵ Gaz. hebdom. de Méd. et de Chir., Feb. 16, 1899.

⁶ Phila. Med. Jour., Sept. 10, 1898.

⁷ Intercol. Med. Jour. Austral., Apr. 20, 1899.

⁸ Therap. d. Gegenw., Jan., 1899.

the general improvement being very pronounced. The local process remained practically unchanged, continuing its usual course.

Maragliano¹ states that he has established the fact of a **specific action of digitalis** on the pneumococcus, since he finds that small amounts added to cultures will kill the organism, or when added to injections of the pneumococcus-toxin will neutralize this poison. To this action of digitalis he attributes the favorable action in pneumonia of large doses of digitalis.

A. H. W. Ayling² recommends strongly the use of tincture of **digitalis** combined with tincture of **ferric chlorid** in the treatment of pneumonia.

H. W. King³ has had good results from the treatment of a case of pneumonia of the apex by large doses of the tincture of **ferric chlorid**.

W. C. Sebring⁴ used **salicylic acid** in treating 100 cases of pneumonia, giving from 8 to 10 gr. every 2 hours. But 1 death occurred, the symptoms were much improved, and the course of the disease shortened; he believes that the remedy is practically a specific.

G. Stokes⁵ reports a case of acute pneumonia in which he used **continuous inhalations of oxygen**. He directs attention to the necessity of using an apparatus with a gas-bag, in order to control the pressure and the amount of oxygen used, and to supply the gas properly warmed to the patient.

M. Manges,⁶ in discussing the treatment of acute lobar pneumonia, recommends the use of **large, flat ice-bags** on the chest over the affected area, for the relief of the pain resulting from the localized pleurisy. He has had good results from the use of **heroin** to control pain.

S. Baruch⁷ considers that **cold applications** are of value in the treatment of pneumonia, through the production of contraction in the vessels of the skin, which increases blood-pressure and improves the circulation. He does not advise the full bath, but considers wet compresses over the chest quite as useful and much less disturbing.

Drago⁸ believes that **venesection** should be used more frequently in pneumonia, and considers it valuable in many other infectious fevers, believing that the epistaxis which occurs in typhoid fever, as well as small hemorrhages seen in some other infectious diseases, are conservative and are often to be encouraged. He reports 5 cases of pneumonia treated by venesection, 4 being cured.

Cantiere⁹ has used **Pane's serum**; and has seen improvement of the general condition, while the pulmonary signs also showed improvement.

C. E. Elfstrom and A. V. Grafstrom¹⁰ report upon the use of **heated blood-serum** in the treatment of pneumonia and tuberculosis. Elfstrom was led to use this treatment by noting that in the Klemperers' work on the serum-treatment of pneumonia the potency of their serum was increased by subjecting it to a temperature of 41° to 42° C. Elfstrom believed that the heating was probably the cause of this, and therefore he

¹ Gaz. degli Ospedali, No. 31, 1898.

² Ibid., Nov. 12, 1898.

³ Lancet, May 13, 1899.

⁴ N. Y. Med. Jour., Jan. 7, 1899.

⁵ Clin. Med. italiana, p. 689, 1898.

⁶ Brit. Med. Jour., July 25, 1898.

⁷ Med. Rec., Apr. 22, 1899.

⁸ Med. News, Jan. 7, 1899.

⁹ Riforma Med., Mar. 4, 1899.

¹⁰ N. Y. Med. Jour., Aug. 29 and Oct. 15, 1898.

took blood from patients with pneumonia, heated it to a temperature of 60° C., and reinjected the serum into the patients. In 4 cases of pneumonia treated, results were yielded that to Elfstrom seemed encouraging [though to an impartial observer they are certainly very doubtful]. Grafstrom reports several cases of tuberculosis treated similarly, and in his opinion showing improvement in respiration, local signs, and sweats. Later they report 2 further cases of lobar pneumonia treated by injections of heated blood. In 1 case rapid recovery ensued, while the other was fatal.

ASTHMA AND EMPHYSEMA.

A. Fränkel,¹ after reviewing earlier theories concerning the **etiology** of asthma, details a case that occurred in a man with gouty arthritis, emphysema, and chronic bronchitis. Severe attacks of asthma occurred repeatedly, and death occurred in an attack. The postmortem examination showed that there was very marked desquamative catarrh of the small bronchi, the cast-off cells filling the lumen of the bronchi. A number of cases similar to this may be found in the literature, and since Weigert has shown that the important predisposing cause of the production of fibrin upon mucous membrane is the preliminary loss of the epithelium, Fränkel believes that in probably most cases of asthma the earliest change is loss of the epithelial cells; this may very possibly be due to the force of nervous spasm, and Fränkel considers that there is a nervous element in practically all cases of asthma.

J. C. Thorowgood² believes that some cases of asthma are due to spasmodic **contraction of the arterial system**, without spasm of the bronchi. In 1 case that he records there were the usual signs of spasmodic asthma, except for a lesser degree of wheezing in the lungs, and with this there was evident pallor. In many cases the use of drugs that relax arterial spasms causes rapid cure of the attack of asthma; and this, Thorowgood considers, confirms his theory.

E. Barth³ discusses the occurrence of asthma from **hysterical paralysis of the diaphragm**. He describes the case of a subaltern who exhibited sudden aphonia after severe exertion. This persisted for 2 weeks and then disappeared; but later the man became dyspneic and had palpitation. The lungs were normal, with the exception of overdistention. Respiration was carried on by the aid of the auxiliary muscles. Apart from the symptoms mentioned, the man seemed well and was in good spirits. The diaphragmatic spasm persisted for weeks without any distinctly hysterical stigmata; but faradism and respiratory gymnastics, without other treatment, brought about entire recovery.

A. Abrams⁴ reports a case of **diaphragmatic dyspnea** that occurred in a woman of 27. Various diagnoses had been made, but Abrams was unable to discover any abnormality upon physical examination except the high position of the diaphragm and absence of Litten's phenomenon, with marked costal type of respiration; also the epigastric and hypochondriac regions were drawn in during inspiration and pressed outward during expiration. The x-rays showed normal heart and lungs,

¹ Zeit. f. klin. Med., Band 35, Heft 5 u. 6.

² Lancet, Dec. 17, 1898.

³ Berlin. klin. Woch., Oct. 24, 1898.

⁴ Phila. Med. Jour., Feb. 29, 1899.

but suspension of the diaphragmatic movements. At intervals there were attacks of severe dyspnea associated with sudden contraction of the diaphragm. The condition was thought to be a neurosis of the phrenic nerves.

F. Ehrlich¹ reports an interesting case of **dyspeptic asthma**. The affection had existed for some years, but vanished after the removal of nasal polyps. After some time, however, the attacks reappeared, and then seemed entirely dependent upon the ingestion of food. The patient was found to have gastrosuccorhea, with some atony of the stomach and enlargement of the liver. Lavage, suitable diet, and the use of alkalies and small doses of atropin caused the attacks to disappear almost entirely. The occurrence of asthma from 2 reflex causes led Ehrlich to believe that there was some special predisposition to the affection, and that probably this lay in abnormality of the heart, since the man had previously had rheumatism, though there was no evidence of rheumatic lesion, and the attacks disappeared completely when digitalis was used. [We have recently seen a remarkable case of asthma of 30 years' duration, in which relief of gastric disturbances was followed by complete subsidence of the asthma.]

Treatment.—S. Talma² believes that it is often possible for asthmatic patients to exercise a certain degree of **voluntary control of the attacks** by controlling the size of the air-passages. He endeavors to teach asthmatic patients to overcome their attacks by proper breathing, and instructs them by placing one hand upon the chest and the other upon the abdomen, pressing first with one hand, then with the other, to teach the patient the proper rhythm, instructing him at the same time to breathe deeply.

A. MacGregor³ reports a number of cases of asthma, due to various causes, that were much improved by the use of **paraldehyd**. W. Mackie⁴ has had good results from the use of paraldehyd as a respiratory sedative in both functional and organic diseases.

C. v. Noorden⁵ strongly recommends the use of **atropin** in the treatment of bronchial asthma, giving first the daily amount of $\frac{1}{120}$ gr., and increasing this until $\frac{1}{6}$ gr. is given daily, and then gradually diminishing the dose, repeating this treatment every few months, though giving less of the drug in each course of treatment and using it over a shorter period.

Bruck⁶ treated 2 cases of bronchial asthma with **ether**. In 1 edema of the lungs seemed imminent, and he used ether hypodermically; both cases improved rapidly during the attack. Both were due to the inhalation of dust, and when the patients changed their apartments they remained free from attacks.

Frese⁷ describes a compound of iodine and fat, called **iodipin**. He has used it in doses of 2 or 3 teaspoonfuls daily, with good results in chronic asthma, emphysema, and bronchitis. It did not disturb the stomach and caused no symptoms of intoxication, though it seemed more active than the alkaline iodids.

¹ Arch. f. Verdauungs-Krankh., Band 5, Heft 1.

² Berlin. klin. Woch., Dec. 26, 1898.

³ Lancet, Mar. 18, 1899.

⁴ Memorabilien, Mar. 13, 1899.

⁵ N. Y. Lancet, Apr., 1899.

⁶ Therap. Monatsh., Heft 10, 1898.

⁷ Münch. med. Woch., Dec. 14, 1898.

H. Leo¹ reports most satisfactory and encouraging results from the use of **heroin** in cases of pulmonary dyspnea the result of emphysema and bronchitis, and also in 2 instances in dyspnea accompanying uremia. Of 8 cases of emphysema, it relieved the dyspnea greatly in 7 instances; while 15 cases of chronic bronchitis with severe dyspnea showed good results. In most cases the use of 1 powder containing 5 mg. caused improvement at once. He believes that it is the most satisfactory drug yet prepared for the treatment of dyspnea. In a note to the article, J. Schwalbe says that he has had excellent results in 2 cases of severe chronic bronchitis, with marked dyspnea and inability to expectorate, from a combination of heroin and potassium iodid. A. Eulenburg² reports that he has had a soluble heroin muriate prepared, and that this is valuable for hypodermic use. It should not be given in doses greater than 1 cg., since slightly larger doses in 2 instances caused general distress, nausea, and vertigo; in 1 case vomiting, and in both subsequent weakness for a number of hours. The preparation can be used by the mouth for fluid dosage, if desired; the dose in this case should be from 5 mg. to 1 cg. 3 or 4 times a day. For the present, small doses should be used and administered with some care, as the toxic properties of the drug are not thoroughly well known.

B. Robinson,³ in a paper on asthma and its treatment, directs attention to the frequent **danger in using nitroglycerin** or the nitrites, since the relaxation of the arteries seems merely to add to the pulmonary congestion and to overtax the heart still more. A case is described in which inhalations of amyl nitrite caused very alarming increase in the dyspnea.

MISCELLANEOUS DISEASES OF THE LUNGS.

Foreign Bodies in the Lung.—C. O'Donovan⁴ reports a case in which bronchitis and pneumonia gradually developed after the extraction of a tooth. Signs of a cavity developed in the lung, and 15 weeks after the trouble began a severe attack of coughing brought up a piece of amalgam-filling that had evidently been inhaled during the extraction of the tooth, while the patient was under nitrous oxid. Entire recovery ensued.

Echinococcus.—Levy-Dorn and Zadek⁵ describe a case of echinococcus of the lungs that was examined by the x-rays, and through this means it was discovered that there was a considerable involvement of the right lung, with a small patch in the left lung, the latter being undiscoverable upon ordinary physical examination. A band could be seen leading from the patch in the right lung to the diaphragm, and this led to the belief that the disease had originated in an echinococcus-affection of the liver.

Anthrax.—Schottmüller⁶ reports 2 cases of anthrax of the lung. One patient evidently acquired the disease from using strips of hide in making baskets; while in the other case no explanatory history was obtained. The symptoms of the disease seen in these cases—and common to others—are sudden onset, with dyspnea, headache, chill, gastric dis-

¹ Deutsch. med. Woch., Mar. 23, 1899.

³ Therap. Gaz., Jan. 16, 1899.

⁵ Berlin. klin. Woch., May 15, 1899.

² Ibid.

⁴ N. Y. Med. Jour., Nov. 26, 1898.

⁶ Münch. med. Woch., Sept. 29, 1898.

turbance, oppression, and pain in the epigastrium; and often with paryza and lacerimasia there is a general severe weakness, with a striking tendency to collapse, an exudate appears in the pleura, and some consolidation is found in the lungs. At first there is fever, and later the temperature becomes subnormal. The sputum may not be characteristic, but it is often of prune-juice appearance. The disease may attack other organs, and then the symptoms become complicated. The prognosis is very unfavorable.

Malignant Tumors.—P. Claisse¹ reports that in a case of **carcinoma** of the lung he established the diagnosis before the physical signs had become distinctive, by finding masses of carcinomatous cells in the sputum. In order to discover these, he recommends dropping the sputum into a large vessel filled with water, and picking out the small particles that are suspended in the upper portion. Thionin is a satisfactory differentiating stain in distinguishing cast-off necrotic cells from those of carcinoma. Ménétrier, in discussion, stated that he had similarly established a diagnosis of primary carcinoma of the lung and 1 of secondary carcinoma with pulmonary tuberculosis.

W. C. Bosanquet² records a case of intrathoracic tumor in which there were secondary growths in the brain, resulting in **crossed paralysis**. The latter had been the most noteworthy symptom in the latter portion of life, though there had been cough, pain, tenderness, and emaciation, with signs of pressure in the thorax. The postmortem showed numerous carcinomatous nodules of the pleura, and the lower lobe of the right lung was largely transformed into a carcinomatous mass. There was a secondary carcinoma at the vertex of the brain in the posterior part of the right superior and in the right marginal convolution. A second growth was seen in the posterior limb of the right internal capsule, a third in the right external capsule, and a fourth in the right centrum ovale, and there was a patch of softening in the anterior portion of the left internal capsule. The growth was probably primary in the lung.

DISEASES OF THE PLEURA.

E. Weleke³ describes a case in which **peculiar parasites** were found in the pleural cavity. The man's illness began with an acute pleurisy, followed by effusion, and the fluid contained thread-like parasites, some of which showed a spindle-like enlargement at one extremity. All of them were active. They were much like the *Cercomonas intestinalis*, but not entirely similar to it. Operation was considered, but the patient had a constant, violent cough and expectorated a large amount of pus, and afterward none of the parasites was found in the pleural cavity. These parasites did not grow upon culture-mediums, and when the infusion was injected into a rabbit's pleural cavity pus was obtained which contained only staphylococci. Probably these parasites were merely a secondary infection, as they are often found in dust and insects.

J. R. Jieinsky⁴ records a case of pleurisy that occurred in a man of 24, subsequent to an attack of **gonorrhea**. Tubercle-bacilli were absent

¹ Gaz. hebdom. de Méd. et de Chir., Jan. 19, 1899.

² Lancet, July 16, 1898.

³ Münch. med. Woch., Aug. 23, 1898.

⁴ Jour. Am. Med. Assoc., Feb. 4, 1899.

from the exudate, but numerous diplococci were found that were considered to be gonococci. [This diagnosis is open to question, however, since no cultures are reported.]

Schule¹ discusses the **diagnosis of pleural and pericardial exudates**. In 2 cases of pleurisy, the physical signs of which had led to a diagnosis of fluid exudate, a friction-sound was suddenly heard over a portion of the dull area; fluid was found, however, upon puncture. The combination of signs observed in these cases is believed to be brought about by the existence of a fluid exudate together with partial adhesion between the visceral and costal pleura, the neighboring portions coming in contact and giving the sound: therefore the occurrence of such signs should not always lead to a diagnosis of fibroid pleurisy. As to the diagnosis of pericardial effusion, he states that the dullness under the manubrium must be associated with extension of dullness beyond the apex-beat and the feebleness of impulse. Experimentally, the injection of fluid into the pericardial sac causes the appearance of dullness on the right of the sternum only when very large amounts are used, and he finds that the shape of the dullness is commonly that of a right-angled triangle, the vertical line being one dropped directly from the sternoclavicular junction.

G. Carrière² discusses the **displacement of the heart and abdominal organs** that occurs with pleural effusions. Left-sided effusions are more likely to displace the heart than are effusions on the right when they are small; and if there is as much as 3 liters, effusions on the left push the whole mediastinum with the heart toward the right. Effusions on the right as large as 1 liter commonly cause no displacement of the heart; but if greater, the apex will be found pushed to the left. Bilateral effusions push the heart downward. The arterial tension is commonly increased with pleural effusions. With left-sided effusions the left lobe of the liver is pushed downward, and the organ is tilted somewhat. Right-sided effusions push the whole organ directly downward, as do double effusions; but unless effusions on the left reach 2 liters, commonly no effect is produced; but an effusion of 1 liter in the right cavity will cause some depression of the liver. Left-sided effusions of 2500 gm. cause the stomach to become somewhat more horizontal. Right-sided effusions of 2 liters push the stomach to the left. This pressure may at times result in gastropnoia. The spleen may be displaced somewhat, and the left kidney is sometimes pushed forward by large left-sided effusions.

W. Janowski³ draws attention to the importance of **crepitation at the base** of 1 lung as a sign of a very slight pleural effusion, so small as to be almost or quite undiscoverable by the usual signs of examination. In larger effusions the sign is of little importance, because other signs are more prominent. Janowski states that he has been able to discover a pleural effusion in a number of cases by attention to this sign, and has confirmed his diagnosis by aspiration. Other signs in these cases have consisted only of very slight dullness, possibly some decrease in the fremitus and in the intensity of the breathing-sounds; but these were so slight as to be likely overlooked. The crepitation that one hears in such cases is, he states, different from that heard in either the beginning of pneumonia or in the early stages of its resolution. It is slightly moist in

¹ Münch. med. Woch., Dec. 20, 1898.

² Presse méd., Dec. 17, 1898.

³ Zeit. f. klin. Med., Band 36, Hefte 1 u. 2.

character and is more superficial, and even finer than the crepitation of beginning pneumonia. The rales of resolving pneumonia are more varied in their size and are much more moist. Janowski states that this rale which occurs with pleural effusion may be differentiated from the rale of edema of the lung. Both may be present together, and their simultaneous presence is sufficient for a diagnosis of edema of the lung complicated with slight pleural effusion. He believes that the rale is caused by pressure upon the pulmonary tissue. The rale of pneumonia is produced by the excess of fluid in the alveoli, which causes alternating adherence and separation of the walls of the alveoli. In effusion it is caused by the alternating adhesion and separation of the walls, owing to the pressure exerted by the external fluid and the relief of this by inspiration, the amount of fluid in the alveoli in this case remaining normal.

M. Lemoine¹ discusses **senile pleurisy**. It is a frequent complication of disease of the kidneys or of tuberculosis, and often follows pneumonia. It is comparatively rarely primary in advanced life. One cause of considerable importance upon which he insists is pulmonary infarction. He also notes that in old persons there is a tendency for pleurisy to develop on one side and to be followed by involvement of the other pleural cavity before the first attack has subsided.

H. Alston² describes the case of a woman of 20, who had symptoms resembling **acute mania**, and whose temperature from being slightly subnormal went up to 108.2° F. No abnormal physical signs could be elicited, excepting evidences of slight pleurisy. Her temperature declined; but coma came on, and death followed within a few hours.

C. D. Musgrove³ had charge of a man who was exposed to sudden changes of 150° F. in temperature, going into a refrigerating-chamber directly after working about engine-boilers. He developed symptoms of pleurisy, after having a severe chill and a rise of temperature to 104° F. There was a friction-sound over the heart also, and **diarrhea** with membranous discharge. There was improvement, however, within a day, and the man became entirely well.

G. Hodge⁴ reports a case of pleurisy that occurred in a man of 30, of whom no previous or family history is given. **Large bloody effusions** were repeatedly removed from his chest. The disease continued for 7 months, during which time the man at some periods had general edema and was exceedingly ill. Twenty-oneappings were carried out, 14 on the right side and 7 on the left, and over 25 quarts of fluid were removed. Complete recovery followed. No inoculation-experiments were carried out, but no tubercle-bacilli were found in the effusions.

S. Lewis⁵ reports a case in which **aspiration of the pleura** was undertaken for the removal of an effusion. The day following, the temperature was much elevated and continued high, with the appearance of general septic intoxication. The autopsy disclosed an abscess containing about 10 oz. of pus in the lung, at the point at which aspiration had been undertaken. It was believed that the needle had carried septic material into the lung, and had caused the rapid abscess-formation at that point.

L. Guinon⁶ reports a case in which the expectoration of a large amount

¹ Jour. de Méd., July 25, 1898.

³ Ibid., Sept. 24, 1898.

⁵ Phila. Med. Jour., Dec. 24, 1898.

² Brit. Med. Jour., Oct. 8, 1898.

⁴ Canad. Pract., Dec., 1898.

⁶ Gaz. hebdom. de Méd. et de Chir., Feb. 2, 1899.

of fetid pus was accompanied by no more satisfactory physical signs than numerous subcrepitant rales in the upper part of the lung. Operation was finally necessary, and this showed a large cavity, which was drained; but the patient died of repeated hemorrhages. The case proved to be **interlobar pleurisy**. Tuffier, the surgeon in charge, directed especial attention to the importance of the x-rays in diagnosing such cases. Bécère stated that he had diagnosed 10 such cases by the use of the x-rays; but he drew attention to the danger of confusing the radioscopic signs of interlobar pleurisy with those of aortic aneurysm.

Rendu¹ describes 3 cases of **putrid pleurisy** in which **anaerobic microorganisms** were found in abundance. Two cases were cured rapidly through washing the pleural cavity with potassium permanganate. The third improved less rapidly under the use of corrosive sublimate; and Rendu decides that such cases are much more amenable to treatment by potassium permanganate than to most other methods.

D. Grant and J. A. Reid² report the case of a woman of 30, whose serious illness began with expectoration of a quantity of what seemed partly pus. A pleural effusion appeared, and aspiration showed that this was bloody. She soon had **thrombosis** of the left iliac vein, and subsequently pain, with edema of the right leg (probably also thrombosis). Bloody fluid was repeatedly removed, the patient became edematous, and died. No new growth was found, but there were strong, thick adhesions of the pericardium and pleura, and these 2 membranes were closely united by adhesions on the left. The tissue looked caseous, but microscopically showed only the appearance of inflammation with marked obliterating endarteritis. It was believed that it was probably syphilitic in origin.

E. G. Janeway³ reports 2 attacks of **temporary hemiplegia** in an individual with a sacculated empyema, both attacks taking place after the use of hydrogen peroxid to irrigate the sac. In the first attack the man became pale, and lost power in the right arm and leg for about half an hour. He had a similar attack 3 days later, with marked dyspnea. He mentions 2 similar cases; and it is suggested that the attacks were due to gas-embolism, the gas probably being oxygen.

Prozorovsky⁴ has used a mixture of **guaiacol and tincture of iodin**, 1 part of the former to 4 of the latter, as an application in serous pleurisy, painting it on twice daily and covering it with an impermeable dressing. He believes that the exudate was absorbed more rapidly than by any other method of treatment with which he had experience; and unless too many applications were made, it caused no irritation of the skin.

PNEUMOTHORAX.

R. May and A. Gebhart⁵ report a case of pneumothorax that was caused by **aerogenic bacteria**. The patient stabbed himself in the region of the heart, and the wound was followed by fever and the development of an area of dullness in the lower part of the chest, above which tympany subsequently appeared. In the early stage of the case this

¹ Sem. méd., Feb. 8, 1899.

² Intercol. Med. Jour. Austral., Oct. 20, 1898.

³ Am. Jour. Med. Sci., Oct., 1898.

⁴ Presse méd., Jan. 4, 1899.

⁵ Deutsch. Arch. f. klin. Med., Band 61, Hefte 3 u. 4.

tympany became of higher pitch when the patient was upright; later, this change of note became exactly reversed. Aspiration withdrew fluid and frothy pus; gas was subsequently allowed to escape, which was found to be inflammable. The pneumothorax was drained; pericarditis appeared, and at one time 2 liters of fluid were evacuated. Death subsequently occurred. As to the pericarditis, the authors believe that there was first a collection of gas in the upper pericardial cavity, since there was at first loud tympany over that region. It is thought that this was replaced by pus. In the early stage there was a marked change in note when the patient changed position; and it is believed that this also indicated pyo-pneumopericardium. Cultures from the exudate showed the presence of the *Staphylococcus aureus* and the colon-bacillus. The latter produced gas in bouillon, the chief gases formed being H and CO₂. The pneumothorax and pneumopericardium are believed to have been the result of the production of gas by this bacillus.

CHYLOTHORAX.

E. Hahn¹ describes a case of chylothorax resulting from fracture of the tenth dorsal vertebra, caused by the passage of a heavy wagon over the patient's body. A right pleural effusion, which was at first bloody, but soon became apparently almost entirely chyle, developed shortly after the injury; and between Feb. 8 and the time of the man's death on Feb. 23, about **30,000 cc. of chylous fluid** were removed from the pleura by repeated paracentesis. Death occurred at this time, and 7 liters more were found in the right pleura. Hahn divides the cases of chylothorax into 2 degrees of severity, according as the main trunk or the branches of the thoracic duct are injured. The first are necessarily fatal; the latter are likely to recover. The severity of the case is recognized by the rapidity of formation of the chylous exudate.

TUMORS OF THE PLEURA.

Podack² reports with great detail 2 cases of **endothelioma** of the pleura; and from studying these and other cases in the literature, he gives the following points of value in diagnosis: 1. A noteworthy amount of blood in the exudate. 2. Considerable quantities of fat in the exudate. 3. The presence of particles of the growth. 4. The richness of these particles in cells which contain glycogen, or frequently show mitosis or amitosis. Any or all of these signs may be absent, and still endothelial cancer of the pleura be present. An important sign that may be present is constant and gradual increase in the thickness and elasticity of the pleural cavity, so that in spite of the removal of the exudate the signs of pressure upon other organs change but little, and finally the organs become fixed in their abnormal position. Another evidence of this is the fact that strong aspiration must be used to empty the pleural sac, and that the aspirating force must be constantly made greater with each aspiration. The exudate also increases rapidly, the rapidity seeming to be greater after each tapping. There will usually be evidences of contrac-

¹ Deutsch. med. Woch., June 22, 1899.

² Deutsch. Arch. f. klin. Med., vol. 63, Nos. 1 and 2.

tion of the affected side of the chest; but these cannot be considered of much value, since they occur with old pleurisies. One sign of great importance is the discovery of secondary tumor-nodules along the tract of the aspiration wound. This was observed in both of Podack's cases. [We have observed fatty endothelial cells as striking constituents of sediments obtained from pleural as well as from peritoneal effusions in carcinomatous cases.]

MEDIASTINITIS.

T. T. Whipple¹ presents a **study of 36 cases** of chronic mediastinitis which he has collected from the literature. Of these cases, 28 occurred in males. The etiology was very varied. Peritonitis was very frequent, and ascites was present in 16 of 21 cases in which its presence or absence was noted, and was probably dependent upon chronic thickening of the peritoneum. The heart was enlarged in but 11 instances, and therefore this organ does not seem to be primarily affected. It is, on the contrary, often diseased secondarily. In 9 cases paradoxical pulse was noted; several of these presented no constriction of the large vessels by fibrous tissue; this is a contradiction of Kussmaul's belief that paradoxical pulse is practically always indicative of compression of the large vessels. The pleura was affected in practically all instances. As to the diagnosis, Whipple directs attention to prominence of the veins of the arms and neck; cyanosis of the lips, tongue, and face, with puffiness over the face and thorax; and the presence of ascites.

Malignant Tumors of the Mediastinum.—A. Sokolowski² records a case of **lymphosarcoma** of the mediastinum that occurred in a man of 52, who had previously had syphilis. The principal symptom was severe dyspnea. There was dullness under the sternum and on the right side of the chest; the lymph-glands were enlarged; the right pupil was contracted; the veins of the chest and abdomen were dilated. Respiratory puncture led to some confusion in diagnosis, since a purulent fluid was withdrawn from between the third and fourth ribs. This was found at the autopsy to have been derived from a bronchiecatic cavity in the right lung, numerous such cavities having formed as the result of obstruction from the tumor-growth.

DISEASES OF THE MOUTH AND PHARYNX.

A. Jesionek³ reports the occurrence in a case of acute **gonorrhea** of a severe **stomatitis**, with the formation of round, grayish-white patches on the surface of the tongue and cheeks, much swelling and soreness, and evidence of inflammation of the sublingual glands. Cover-glass preparations and cultures showed gonococci. The infection had been of the mouth, and had been preceded by a double gonorrheal conjunctivitis, and the buccal infection was probably secondary to this. There were also swelling, soreness, and restriction of movement in the maxillary joints, and these were attributed to a coincident gonorrheal arthritis.

¹ Lancet, Apr. 8, 1899.

² Deutsch. med. Woch., Dec. 1, 1898.

³ Deutsch. Arch. f. klin. Med., Band 61, Hefte 1 u. 2.

A. J. Hall¹ describes a case in which, during an acute nephritis, there developed a severe **glossitis and stomatitis**, with membrane-formation: bacteriologic examination showed the presence of large numbers of **staphylococci**. Infection was believed to have come from a case of follicular tonsillitis lying near this patient.

W. K. Sibley² describes 3 cases of **neurotic ulceration** of the mouth, all of which occurred in women beyond middle age, who were of very neurotic temperament. The ulceration had occurred repeatedly throughout a number of years in all cases, and had given rise to very great pain and difficulty in mastication and, at times, in speech. Sibley believes that the ulcers were dependent upon a trophoneurosis, and that the only satisfactory treatment is that directed to the general condition.

Schüle,³ in investigating the activity of the **diastatic ferments of the saliva** at various periods of the day, found it increased from early morning until mid-day, reaching its maximum activity between 11 and 3 o'clock, and slightly declining after this time. He also reports some cases to show the importance of saliva in the gastric digestion in increasing the secretion of gastric juice. He gave the same food through the stomach-tube at one time, and at another time had the patient chew the food and then swallow it. In the latter case the stomach-contents were always richer in HCl and ferments—a result that has been observed by other experimenters. [We have ourselves observed the same in a number of cases examined in a similar way.] Schüle attributes this effect to the reflex action when food is taken into the mouth, since he has shown that the mere presence of food in the mouth causes a secretion of gastric juice.

A. J. Lartigan⁴ describes a case of **xerostomia** which occurred in a man of 64, who was of very nervous temperament and whose family was neurotic. The affection appeared a few weeks after his wife had suffered a tragic death. The salivary glands were normal in size and had never shown any enlargement; the sense of taste was diminished. Perspiration had decreased very greatly after the salivary secretions had disappeared. No treatment was of permanent value. A. J. Hall⁵ records a case of xerostomia, and gives a study of 39 cases which he has collected. His case occurred in a woman of 49, and followed an attack of influenza. The patient was not neurotic, and had had no shock nor worry. The salivary glands had not at any time been swollen. In the cases he collected, he finds the details are present in 36. Of these, 32 were females. Most of them occurred in individuals over 40. The mucous membrane of the nose was affected in 10; that of the eyes in 7. The skin was noted as being dry in but very few cases. In a number of cases marked crumbling of the teeth was found present. In several cases the onset was sudden; and in 6 it followed severe shock. In most cases the causes were unknown.

H. Salomon⁶ has found in 3 cases of **ulcerating tonsillitis** the **bacilli and spirilla** previously described by Bernheim and others in cases of stomatitis. All these cases were of favorable course; and he believes that the discovery of this organism is usually sufficient to establish a prognosis of rapid and favorable course.

¹ Brit. Med. Jour., July 16, 1898.

² Ibid., April 15, 1899.

³ Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

⁴ Med. News, Oct. 29, 1898.

⁵ Quart. Med. Jour., Oct., 1898.

⁶ Deutsch. med. Woch., May 11, 1899.

W. G. A. Robertson¹ discovered a **tonsillar calculus** which weighed almost 1 oz., and measured 42 by 36 mm. It occurred in a patient who had a gouty tendency. It was expelled from the tonsil during an attack of coughing. R. H. Strong² reports the case of a boy of 13, who expectorated 2 tonsillar calculi. They had given no pain and had caused no inflammation.

M. de Rochmont³ insists upon the **necessity for isolation** in ordinary cases of angina, and describes an epidemic which began in an attack of tonsillitis in a woman with articular rheumatism; 18 other cases developed in the hospital in patients who were near the first. The microorganisms found upon culture were staphylococci and streptococci. In 3 of these cases articular rheumatism appeared, and pericarditis, endocarditis, marked cardiac depression, and nephritis were each noticed once.

A. J. Lartigau⁴ reports 3 cases of severe acute angina in which there was a distinct formation of **pseudomembrane**, and from each of which the **Micrococcus tetragenus** was obtained by culture. He agrees with Apert in thinking that this microorganism sometimes acquires virulence and produces angina; that the angina in pure infections has a peculiar appearance; but that in some cases this microorganism is present in the throat without causing the disease.

S. Pechkranz⁵ considers **pyrosis** and the irritation that it causes in the pharynx a frequent and commonly overlooked cause of cough, which in many cases is persistent, and is incurable without treatment of the pyrosis.

W. G. Spencer⁶ used **streptococcus-antitoxin** in a case in which streptococcus-pharyngitis had been followed by marked glandular enlargement, signs of general septicemia, and involvement of the pleura and pericardium. After the use of 3 doses within 24 hours an astonishing improvement was noted, and within a few hours the temperature had become normal, and subsequently remained almost entirely so; the patient eventually recovered completely.

H. v. Rosen⁷ reports a **curious case of bleeding** from the mouth in a boy of 9, which was due to the lodgement in his throat of a leech which had been accidentally taken in drinking-water. There was great difficulty in dislodging the leech, since it was so low down it could not be reached. This was finally accomplished, however, by using gargles of potassium permanganate.

DISEASES OF THE ESOPHAGUS.

L. Huismans⁸ reports a case of **esophagitis and periesophagitis**, with the production of abscess and stricture of the esophagus. The man had had considerable pain. The passage of bougies had been extremely painful and difficult at times; while at others it was easy. The patient had no fever. Shortly before death there was severe dyspnea, and he developed dullness posteriorly, and subcutaneous emphysema appeared in the neck. The postmortem disclosed an abscess almost encir-

¹ Brit. Med. Jour., Jan. 7, 1899.

² Münch. med. Woch., Mar. 7, 1899.

³ Wien. med. Woch., Apr. 8, 1899.

⁴ St. Petersburg med. Woch., No. 10, 1899.

⁵ Ibid., May 6, 1899.

⁶ Phil. Med. Jour., Apr. 22, 1899.

⁷ Lancet, Jan. 21, 1899.

⁸ Deutsch. med. Woch., Apr. 27, 1899.

cling the esophagus. The emphysema was due to gases produced in the abscess; while the variation in the symptoms had been due to variations in the size of the abscess.

F. Ehrlich¹ reports what he says is the first case on record of **stenosis** of the esophagus **following scarlet fever**. The patient, a boy of 5 years, had had severe anginoid scarlatina, in which the ulceration of the throat had been extremely deep. Symptoms of stenosis of the esophagus came on almost immediately after this. There was no history of syphilis, injury by caustics, or of any other cause for this condition other than the fever. Examination with bougies determined a stenosis about 18 cm. from the incisors. Unsuccessful attempts were made to dilate the stenosis by means of retrograde sounding after gastrotomy, sounding through an esophagoscope, and other methods; but success finally resulted from the use of a spiral bougie, followed by laminaria tents and the subsequent passage of bougies of increasing diameter. The child regained entire health. The same author² records a second case of stricture of the esophagus after scarlet fever. It occurred in a man of 32, who had had scarlet fever when 18 months old. After this time he had difficulty in swallowing, which had ultimately become very severe. Marked improvement was obtained from the introduction of laminaria tents through the esophagoscope and the subsequent use of sounds.

R. Benjamin³ says that if a patient with benign stricture of the esophagus is given sufficient food, the metabolism will be about normal; but if the disease is carcinomatous, the nitrogen-excretion is excessive. If, therefore, it is possible to introduce the proper amount of food in cases of stenosis of the esophagus, studies of metabolism are of much diagnostic value.

J. D. Lewis⁴ had under his care a woman of 36, who had suffered since childhood from contraction of the esophagus as the result of swallowing lye. When he saw her she had sudden complete obstruction of the esophagus, due, she believed, to swallowing boiled potatoes. The **ingenious treatment** adopted was administration of hydrogen dioxid—this caused effervescence and removed the obstruction.

H. Störek⁵ reports a case of **pulsion diverticulum** at the upper portion of the esophagus, due to the pressure of a mass which, upon post-mortem examination, proved to be a colloid goiter. The diagnosis in this case was properly made, largely through the service rendered by the x-rays, which showed the limits of the tumor, and, when the sac was filled, also the outlines of the diverticulum. When the sac was empty the outline of the diverticulum could be seen as a bright area after the introduction of the gastrodiaaphane.

S. Landauer⁶ reports a case of **diverticulum of the lower portion** of the esophagus. He finds but 4 similar cases in literature. The man complained of increasing difficulty in swallowing, and had the sensation that his food passed through the esophagus in a spiral course. Fluid could be expressed from what was apparently a sac in the esophagus; and if colored fluid was introduced into this sac and a tube with perforations along its side introduced into the stomach, none of the fluid from the

¹ Berlin. klin. Woch., Oct. 17, 1898.

² Ibid., Dec. 12, 1898.

³ Ibid., Aug. 15, 1898.

⁴ Med. Rec., July 23, 1898.

⁵ Berlin. klin. Woch., June 12, 1899.

⁶ Centralbl. f. innere Med., Apr. 22, 1899.

sac was obtained through the latter tube. It seemed, therefore, to be a diverticulum rather than a simple dilatation of the esophagus. The symptoms were entirely relieved by keeping the sac washed out.

H. Westphalen¹ records a case that occurred in a hysteric woman of 44, and which was diagnosed **diffuse idiopathic dilatation** of the esophagus from spasm of the cardia. The woman had evident stagnation in her esophagus, and the only difficulty in diagnosis was between diffuse dilatation and diverticulum. The latter was believed to be excluded by the existence of a peculiar sound replacing the second sound upon swallowing; this had the character of the sound produced by pouring water into a vessel already containing fluid. A still more important sound, in Westphalen's belief, was severe spasmodic cough, coming on when the horizontal position was assumed, and caused, in his opinion, by the fluid rising at such times to the level of the larynx, and producing the cough by gaining entrance to the larynx.

G. Rosenfeld² reports a case of widening of the esophagus, the question in doubt being whether it was a diverticulum or not. This was settled by introducing a stomach-tube to which was attached a condom filled with bismuth solution. The shadow of this, when viewed with the fluoroscope, lay back of the heart and was not distinctive; but when the bismuth was washed out and the condom distended with air, a bright area was seen of a shape that showed that the esophageal difficulty was a diverticulum. Rosenfeld recommends **radiography in the diagnosis** of carcinoma of the stomach, also. He first introduces a tube filled with shot; this will be seen keeping the position of the greater curvature, and even in very recent tumors there will be seen a shadow above and to the right of the tube. He believes that the positive demonstration of the fact that the stomach is very small when there is coincident stagnation of food speaks strongly in favor of carcinoma of the stomach. [We have used radiography in various ways to determine the outlines of the stomach, and have concluded that the method is far inferior to inflation, and much more difficult.]

H. Hildebrand³ found in the esophagus of an individual who had committed suicide by hanging, two small areas of bright-red color, which presented a soft, velvety surface. These were at about the level of the cricoid cartilage. The man had frequently complained during life that there was something in his throat. Microscopic examination showed that these areas were **masses of glands**, entirely resembling the glands of the fundus of the stomach. Such displacements are of much interest in the consideration of the origin of carcinoma of the esophagus, especially of the unusual cylindrical-cell carcinomas.

T. Rosenheim⁴ had a case in a man, 62 years old, who had difficulty in swallowing, and marked emaciation, which had progressed rapidly. Examination with the **esophagoscope** showed a pale mucous membrane; but the stricture itself could not be seen. The diagnosis was **carcinoma**. The patient died shortly afterward, and the postmortem examination showed a diverticulum that had progressed with unusual rapidity. Another case is reported in the same paper, in which a diag-

¹ Arch. f. Verdauungs-Krankh., Band 5, Heft 1.

² Centrallbl. f. innere Med., July 23, 1898.

³ Münch. med. Woch., Aug. 16, 1898.

⁴ Deutsch. med. Woch., Jan. 26, 1899.

nosis of carcinoma had been made elsewhere. Rosenheim, from the appearance of roset-like folds seen upon introduction of the esophagoscope, diagnosed spasm of the esophagus, and within 3 months the condition of the patient became greatly improved. Since other etiologic factors were absent, the spasm was attributed to a gouty diathesis.

J. A. Lindsay¹ describes the case of a man of 59, who, after taking a bottle of stout, had sudden violent epigastric pain, with vomiting, followed by the appearance of a large right-sided pleural effusion and of subcutaneous emphysema of the left side of the face, neck, and chest. He died the next day, and autopsy showed that the condition was due to an **ulcer of the esophagus**, $1\frac{1}{2}$ in. long, which communicated with an abscess in the posterior mediastinum. The latter had ruptured into the lung at its root. The cause of the ulcer was thought to have been syphilis.

W. Lowe² records a case of **cardiospasm** or **esophagismus** in a laborer, 24 years of age. He had difficulty in swallowing, and was often obliged to force food into his stomach by taking large draughts of water; otherwise the food would be regurgitated. He went through this process repeatedly with each meal. The only history of importance was excessive use of tobacco. There was no evidence of organic disease of the esophagus.

DISEASES OF THE STOMACH.

Methods of Examination.—L. Leney and V. Harley³ investigated the quantity of **volatile acids** found in normal and pathologic conditions in the stomach-contents. Their method was to dilute a known quantity of the unfiltered contents, and distil it by driving superheated steam through the flask, which was heated at the same time. The distillate was collected in $\frac{1}{10}$ normal sodium hydrate, and the latter titrated. They decide that the normal stomach contains a small amount of volatile acid, the percentage in terms of NaOH solution not reading more than 3.2 if the HCl and motility are normal. The most active cause of increase of volatile acids was diminution in the HCl, though lessening of the motility caused some increase. When both motility and free HCl were effective, the volatile acids averaged about 7.47%.

G. Rosenfeld⁴ claims that even the more modern teaching concerning the **position of the stomach** and the course which its curvatures run is erroneous. His investigations have, he believes, taught him that the lesser curvature is similar in its course and shape to an upright reversed C, running first to the left and downward, and then slightly upward and to the right, and not, as usually taught, traversing a curved horizontal course from left to right. The stomach, he believes, is almost vertical in its position until the pyloric portion is reached, when it becomes nearly horizontal. He objects to the term *gastroptosis*, since, if his description of the normal position of the stomach is accepted, it may readily be seen that the condition termed *gastroptosis* is but a vertical dilatation of the stomach; namely, a dilatation in its long axis which carries the lesser curvature downward. He describes 2 forms of dilatation: the first, just mentioned, a dilatation in the long axis; the second form, horizontal dila-

¹ Dublin Jour. Med. Sci., Apr., 1899.

² Interecol. Med. Jour. Austral., Mar. 20, 1899.

³ Brit. Med. Jour., May 27, 1899.

⁴ Centralbl. f. innere Med., Jan. 7, 1899.

tation, or dilatation of the lateral axis. There is a third form, which to some extent affects the fundus major, but is chiefly seen at the fundus minor. He then describes his **method of investigating** the size, form, and position of the stomach, after insisting that the methods previously in use are all unsatisfactory. He uses a tube similar to the ordinary tube, excepting that the lower end is closed and there are numerous small openings along the sides. This is filled with large shot and then introduced; it may be either observed with a **fluoroscope** or a skiagraph taken of it, thus demonstrating its position. He then inflates the stomach with air, and once more examines it by the aid of the x-rays; he states that the organ may be clearly observed as a bright zone surrounding the dark line given by the shot-filled tube, its limits being clearly marked off. [Our observations by clinical methods and at autopsies convince us that the author's views regarding the position of the stomach are erroneous. We have found the position very nearly that described by Luschka.]

R. Stern¹ believes that a method of examination of the stomach that is of value is the **observation of the shadow** that follows the movements of the lower border of the stomach upon respiration. In case the patient be not too obese and has fairly lax abdominal walls, he considers that the position of the lower border of the stomach can be determined with a considerable degree of accuracy. In case a gastroptosis exists, the position of the lesser curvature also may be observed in this way; the size of the stomach, too, may be determined fairly well. The patient should be placed in a horizontal position in a good light which falls over him from a window back of his head, and the examination should be made at a time when the stomach contains at least a moderate amount of contents. It is well also not to empty the bowels before the examination.

W. Roth and H. Strauss² have investigated the functions of the human stomach by introducing solutions of sugar and sodium chlorid and determining the change in the **depression of the freezing-point** which occurred during the time that the solutions remained in the stomach. They used hypertonic, isotonic, and hypotonic solutions. With the hypertonic, they found that the freezing-point became lower, and that therefore the molecular concentration had been lessened. However, the molecular concentration was greater than could be considered due to the amount of sugar or salt remaining. There was certainly some secretion by the stomach which altered the molecular concentration. Isotonic solutions also were diluted. The stomach therefore must have secreted a diluting fluid through some vital power of the organ, since simple physical osmosis would not have taken place with isotonic solutions. There seems therefore to be a specific diluting secretion produced by the stomach. There was a lessening of the concentration of hypotonic solutions, also. Therefore this work seems to be definite proof of the existence of osmosis in the stomach, and of a diluting secretion and a specific secretion, the chief function of the stomach being secretion and not absorption. Pathologic cases were investigated, without very definite results so far. In 1 case, however, there was a marked difference. This was an instance of motor insufficiency with subacidity. It is therefore possible that the method may be important as an aid in determining an excessive time of retention of the contents in the stomach.

¹ Centralbl. f. innere Med., Oct. 29, 1898. ² Zeit. f. klin. Med., Band 37, Hefte 1 u. 2.

A. Tuschandler¹ believes that in investigating the motor power of the stomach one should always note 3 things: the amount of contents in the stomach after a test-meal, the result of the **currant-seed test**, and the result of the **fermentation-test**, besides investigating carefully the outline of the stomach. He has found in a number of cases of the series presented in this paper that the amount of stomach-contents was small though the currant-seed test and the fermentation-test were both positive; most of these cases were ulcer or carcinoma, in which there were probably irregularities on the inner surface of the stomach. He therefore thinks that such evidence of irregularity of the gastric mucous membrane is of diagnostic importance in relation to ulcer and carcinoma. Most of the cases that showed more than 150 cc. of contents 1 hour after a test-break-fast were instances of either hyperacidity or ulcer.

Courtade and Guyon² decide from their researches that excitation of the pneumogastric causes contraction of the longitudinal fibers of the stomach and exaggeration of **peristalsis**; while excitation of the sympathetic arrests peristaltic movements by causing contraction of the circulatory fibers and relaxation of the longitudinal. The pneumogastric is therefore the nerve of evacuation of the stomach; while the sympathetic causes arrest of evacuation.

J. Wiczowski³ has investigated 2 series of cases—1 having constipation, the other diarrhea—in order to determine the **relation between the gastric and intestinal functions**. In the first series he found that during their usual condition of constipation the gastric secretions were more liberal than when purgatives were given. In the second series, with active intestinal movements and diarrhea, the gastric secretions were low; while when the intestinal functions were diminished by the use of opium or other astringent the gastric secretions become greater in amount. He could find no distinct alteration in the amount of absorption from the stomach under these conditions, nor in the motor-power. [These were necessarily imperfectly tested.]

F. H. Murdoch,⁴ after examining 26 cases of **organic heart-disease** as to the condition of the stomach-contents, decides that there is no definite relation between the gastric secretions and any one form of organic heart-disease.

J. A. Lichty,⁵ in discussing the **relation between the blood, the urine, and the gastric contents** in diseases of the stomach, reports 111 cases in which he made simultaneous examinations of the gastric contents, the blood, and the urine, and reached the conclusions that the hemoglobin is often somewhat increased in hyperchlorhydria, decreased in hypochlorhydria, and higher in achylia than in hyperchlorhydria. The red corpuscles follow the course of the hemoglobin quite closely. The urine showed no changes constant enough in relation to the various diseases to enable one to attach any definite diagnostic importance to its examination.

Reach,⁶ in order to test the secretory functions of the stomach without

¹ Deutsch. med. Woch., June 15, 1899.

² Gaz. hebdom. de Méd. et de Chir., Aug. 4, 1898.

³ Arch. f. Verdauungs-Krankh., Band 4, Heft 4.

⁴ N. Y. Med. Jour., June 17, 1899.

⁵ Phila. Med. Jour., Feb. 11, 1899.

⁶ Fortschr. d. Med., Band 16, 1898.

the use of the stomach-tube, gave **capsules of barium iodid** and bismuth oxyiodid, from which iodine is set free only through the action of free acids. He tested the sputum for iodine, and, as the result of his investigations, decides that when the reaction occurs in about 80 minutes the individual is normal; an earlier reaction would indicate hyperacidity; while its later occurrence would mean hypoacidity.

T. Husche¹ has endeavored to find a satisfactory method for the quantitative **estimation of the pepsin** in the gastric juice. None of those yet proposed is satisfactory; but he has found that a combination of the methods of Hammerschlag and Gruentzner give fairly accurate results.

F. Gintl² believes that **Hammerschlag's method** for the determination of the amount of pepsin-digestion of which stomach-contents are capable is the most useful clinical method, and is entirely satisfactory for clinical purposes. He considers that the objection that the time of the digestion in this method is insufficient does not hold; and believes that this point is really a recommendation, because after this brief period of digestion differences between various stomach-contents may be seen to a much more marked degree than after a longer period. He reports his examination of 83 cases, and concludes that when using this method the percentage of digestion in normal cases is from 85% to 96%. A reduction of HCl or its entire absence by no means indicates a similar condition of the pepsin, as in many cases he discovered that pepsin was present in considerable amount, even though the HCl was largely reduced or entirely absent. He has not been able to confirm Oppler's statement that in hyperchlorhydria there is an increase of the pepsin, also. He has found that pepsin-digestion in these cases was within the normal range. In carcinoma he found in most cases that pepsin-digestion was markedly decreased or occasionally entirely absent; but this is not always the case, and sometimes, with entire absence of HCl, pepsin was present in considerable amount. In 2 instances of carcinoma that developed upon old ulcers, pepsin-digestion, like the HCl, was normal; and the marked reduction of pepsin-digestion that does at times occur in carcinoma cannot be considered a very important sign of carcinoma, since it was present quite frequently in cases of hypochylia or achylia.

L. Aldor³ discusses the **antizymotic powers of pepsin**, and the possible relation to gastric fermentation. His results lead him to the belief that even in large quantities pepsin does not influence lactic-acid fermentation, and that whatever inhibition of gastric fermentation occurs is dependent upon the hydrochloric acid. Such inhibition of fermentation results from the action of HCl, most markedly when it is free, but to some extent also when combined with proteids. Pepsin seems to have no active effect upon any form of bacterial fermentation.

J. Troller⁴ has inquired into the presence of **pepsin in the urine**, and especially discusses the relation of its presence to the condition of the stomach-contents. His method was to make a 1% solution of protogen in 0.2% HCl, dissolving it by warming. To 10 cc. of this he added

¹ Münch. med. Woch., Aug. 16, 1898.

² Arch. f. Verdauungs-Krankh., Band 4, Heft 3.

³ Berlin. klin. Woch., July 25, 1898.

⁴ Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

3 cc. of urine, at the same time preparing a control in which 3 cc. of water were used instead of the urine. Both preparations are kept at body-temperature for 24 hours, and the amount of albumin is determined by Esbach's method. He considers that his control-test showed that the results were accurate, and that this method will show pepsin in solutions as dilute as 1:40,000. He found pepsin present in the urine, and considers the amount a distinct indication of the condition of the stomach-contents, since the quantity was strikingly related to the quantity of pepsin found in the stomach-contents in 10 cases examined. He believes that when it is undesirable or impossible to use a stomach-tube, we may draw conclusions as to the condition of the stomach-contents by examination of the urine for pepsin. [An extremely rash conclusion from the examination of only 10 cases by a method that is recognized to be so untrustworthy as Esbach's.]

S. Talma¹ discusses the methods of determining the **degree of fermentation** of carbohydrates in the stomach, and the effects upon this organ of excessive fermentation. Among the latter are motor insufficiency from overdistention of the walls or from pyloric spasm. Hyperchlorhydria may result, and sometimes ulceration; in uncommon instances carcinoma may develop upon the base of such an ulcer. During active fermentation Talma states that the pyloric portion of the stomach can be felt. He considers the intoxication that results from the fermentation the chief element in producing the symptoms of acute, subacute, and chronic gastritis, and of the various forms of intestinal trouble, believing that they are all essentially intoxications.

C. Sternberg² found the so-called **Oppler bacilli** in the vomit and stomach-contents in a case of incarcerated hernia that ended fatally. The culture-characteristics were typical; but it is of interest and importance to observe that 2 forms could be produced. One, long and thin, was usually found when the bacillus was grown upon liquid mediums; the other was short and thick, and developed when the growth was on solid mediums. This is, he thinks, the explanation of the development of the bacillus in various diseases of the stomach, and also of the various forms that may be found in varying conditions of the stomach-contents. The bacillus was not pathogenic to guineapigs; these animals after being injected with the bacillus had, however, an agglutinative principle in their blood-serum when the latter was tested with the bacillus. This he considers of especial interest, since it shows that agglutination occurs with organisms that are not pathogenic with human beings, and that cause but slight general reaction even in the lower animals.

H. J. Knickerbocker³ discusses the Oppler-Boas bacillus, and its importance in diagnosing **gastric carcinoma**, and decides that it is not pathognomonic, but is of the utmost diagnostic value, and that sometimes a discovery of the bacilli early in the course of a case may so far establish the diagnosis as to make extirpation of the growth practicable. [The presence or absence of the Oppler-Boas bacillus seems to depend merely upon the chemic reaction of the stomach-contents and the condition of motility, not upon the character of the disease. The proper conditions are, however, furnished almost exclusively by carcinoma.]

¹ Zeit. f. klin. Med., Band 36, Hefte 5 u. 6.

² Wien. klin. Woch., Aug. 4, 1898.

³ Phila. Med. Jour., Nov. 18, 1898.

F. Lange and Meltzing¹ describe an instrument by means of which they have been able to **photograph the interior** of the stomach. It is, however, not yet perfected, and in its present form they do not consider it of much clinical value, but hope that it may in future become of importance.

G. Kelling² discusses the uses of the **gastroscope**, and describes an instrument that he has devised.

F. B. Turek³ once more recommends his **gyromele**. He believes that it is of value in the diagnosis of cases that have hitherto been subjected to the danger of exploratory celiotomy. The methods of its use in various diseases of the esophagus, stomach, and intestines are described.

Gastritis.—McCaskey⁴ discusses the **neurasthenic symptoms** of gastrointestinal disease. He asserts his belief that while these symptoms are often only a local manifestation of a general condition, still, prolonged neurasthenic alterations in the functions of the stomach or bowels are likely to cause organic changes, and in many of these cases the treatment that will do most good for the general condition is one directed to the improvement in the local affection of the stomach and intestines.

G. R. Butler⁵ insists upon the importance of **gastroenteric forms of rheumatism**, and records 3 cases in which there was an alternation of tonsillitis, acute arthritis, and gastroenteric disturbance, all of these being controlled by the use of salicylates.

H. Cantlie⁶ contributes a comprehensive article on **sprue**. His most notable suggestion is that milk-diet, when too long continued, is, in his experience, harmful, since he thinks that the atonic stomach and intestines need the stimulation of other foods. The carbohydrates should be avoided, but readily digestible meat should be prescribed, beginning with extracts of meat and scraped meat.

E. F. Maynard⁷ considers that **chronic dilatation** of the stomach is frequently associated with **chronic catarrh** of this organ, and reports that in 19 of 27 cases of chronic gastritis he found dilatation. This is believed to be present if the greater curvature reaches within 1 in. of the umbilicus; if there is a distinct splashing sound on palpato-percussion; and if the percussion-area of tympany is excessively large. [The difficulty of determining whether or not actual dilatation is present in such cases is not sufficiently considered. We believe the author's view is probably correct, though the evidence of dilatation is not conclusive.]

N. Reichmann⁸ discusses the following syndrome as almost absolutely **characteristic of atrophic gastritis**. The patient complains of a feeling of constriction about the body, on a level between the umbilicus and the xiphoid, and has nausea, which usually does not become severe, but persists for a long time after each meal, and is accompanied by regurgitation of a peculiar fluid. The nausea and regurgitation are the most characteristic symptoms. The quantity of fluid regurgitated is usually about 50 cc. It is slightly salty in taste, without especial odor, and looks like cloudy water, showing no diastatic nor proteolytic power.

¹ Münch. med. Woch., Dec. 13, 1898.

² Ibid.

³ Med. Rec., Sept. 10, 1898.

⁴ Jour. Am. Med. Assoc., July 30, 1898.

⁵ Albany Med. Ann., Mar., 1899.

⁶ Practitioner, Dec., 1898.

⁷ Brit. Med. Jour., Oct. 15, 1898.

⁸ Ibid.

⁹ Jour. Am. Med. Assoc., July 30, 1898.

¹⁰ Practitioner, Dec., 1898.

¹¹ Berlin. klin. Woch., Nov. 14, 1898.

It becomes more cloudy upon boiling and upon the addition of acetic acid. It seems to be neither saliva nor neutralized gastric secretion. Exactly what it is he is unable to state. The diagnosis of atrophic gastritis may be considered established if such symptoms persist for a long time and secretion from the stomach seems to be persistently absent. Carcinoma causes death of the patient within a much shorter time, even though other distinctive symptoms are absent, though this is not usually the case. Nervous achylia does occur; but the condition of the secretion is then commonly variable, and the patients are characteristic neurasthenics, while the sufferer from atrophic gastritis does not usually belong to the neurotic class. Reichmann considers the symptoms mentioned almost characteristic, but their absence does not exclude the presence of atrophic gastritis.

Neumann¹ describes a case of **iodid-eruption in the stomach**. It occurred in a patient of 30, who had nephritis and hemiplegia. The postmortem showed that besides the skin-eruption there was a marked iodid-eruption near the pylorus, consisting of a number of vesicles and papules from the size of a millet-seed to that of a pea. One small ulcer had developed, evidently from one of these lesions. It seems to be the only case of iodid-eruption in the stomach so far described.

Functional and Neurotic Disturbances.—J. Troller² reports 2 cases of so-called **achylia gastrica**, in both of which free HCl was absent. In 1, however, there was considerable acidity, and lactic acid was not present; and he believes that this acidity was due to combined HCl, and that therefore such conditions should be called **hypochylia** rather than achylia. He found, also, that in both cases the stomach-contents caused some digestion of albumin when rendered acid, and that therefore, as an actual fact, neither was a case of achylia. He considers this an improper name for most instances reported as this condition, and prefers the term achlorhydria, since he believes, with Riegel, that the pepsin is rarely absent. He determined the amount of pepsin-digestion by using Hammerschlag's method, modifying it by using protogen as the proteid upon which the test of the digestive power is carried out. He considers that the use of protogen gives more accurate results than does that of fibrin or egg-albumin, since protogen is entirely soluble in HCl solution, and the action of the gastric juice is therefore more complete and constant. He found the pepsin-digestion much lower in the case in which HCl was absent than in the one in which there was combined HCl. The same condition was found in regard to the milk-curdling ferment and its zymogen. This led him to the conclusion that the degree to which the ferments are reduced is a point of value in cases of achlorhydria in determining the severity and extent of the disease.

A. A. Jones³ discusses the relation between **chronic diarrhea** and **achylia gastrica**. He first draws attention to the fact that the normal gastric juice causes comminution of the food and stimulates pyloric contraction, thus preventing too rapid escape of the stomach-contents and rendering the contents of the stomach less irritant to the bowel when they are allowed to reach the duodenum. In achylia gastrica

¹ Wien. med. Woch., Feb. 11, 1899.

² Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

³ Jour. Am. Med. Assoc., July 30, 1898.

these functions of the gastric secretion are absent; therefore the symptoms in this condition are often intestinal, while gastric symptoms may be almost entirely or completely absent. The treatment he advises is the use of large doses of hydrochloric acid and pepsin, with small doses of tincture of iron and Fowler's solution, intragastric faradization, and the control of intestinal putrefaction, which is best accomplished by calomel. J. M. Anders, in discussion, stated his belief that lenteric diarrhea is less commonly due to nervous achylia gastrica than to intestinal catarrh, as he has frequently observed mucus in the stools. He has often seen achylia gastrica in connection with tuberculosis, and thinks that the gastric condition is often dependent upon general organic disease. C. G. Stockton divides the cases of achylia gastrica into those accompanied by intestinal disturbance and those that are not. The former are by all means the more serious. He believes that the condition is usually nervous, and that when accompanied with severe organic disease it is not, essentially speaking, a true achylia gastrica. An instance of the nervous character of the disease was seen in his practice, in the case of a woman who had frequent irregular attacks of lenteric diarrhea which always ceased during pregnancy. E. P. Joslin, as an illustration of the nervous character of this condition, described a case in which achylia gastrica, splanchnoptosis, and melancholia existed coincidently. He believed that treatment with hydrochloric acid was practically useless, as a sufficient amount could not be given. He recommended the use of finely divided foods with ferments that are capable of acting in neutral mediums; as an instance of such ferments, he mentioned pineapple.

G. Kövesi¹ reports that his examination of the gastric contents in the neighborhood of Budapest showed that 30.4% of the cases had **hyperchlorhydria**, a low proportion as compared with the reports from all other sources excepting Zürich. He has found a number of cases that gave symptoms of hyperchlorhydria even when there were large amounts of free HCl in the gastric contents. These cases usually had large quantities of combined HCl; and Kövesi remarks that inorganically combined HCl in excessive quantities can undoubtedly give the clinical picture of hyperchlorhydria. The condition was most commonly met with in persons between 20 and 40 years of age. His investigations of the gaseous fermentation showed that this, as a rule, occurs most actively in those cases that show absence of free HCl or low acidity in general. This is not always the case, as sometimes it is marked when the HCl is present in considerable quantities. Under these circumstances, the most common cause of fermentation is subnormal motility. He has found gaseous fermentation of the stomach-contents in several cases of gastropotosis, even when there was no marked evidence of lack of motility; but he attributes the abnormality in these cases to a mild degree of motor weakness. He also carried out investigations of the pepsin-secretion by Hammerschlag's quantitative method, and reached the conclusion that when the amount of pepsinogen is determined in this way in the normal stomach-contents, 1 hour after a test-breakfast, it varies from 50% to 60%. There is to some extent a direct relation between the amount of HCl and the amount of pepsinogen secreted. This is, however, not constant. The amount of the pepsinogen is usually decreased in acid stomach-contents, but it is not

¹ Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

commonly entirely absent, and destructive disease of the stomach commonly reduced the pepsin less than it does the HCl. Finally, while the pepsin is usually much reduced or absent in advanced carcinoma, in ectatic and atonic conditions of the stomach of benign basis the pepsin is likely to be normal.

S. Basch¹ presents a study of 25 cases of **gastric crisis**, with an extensive consideration of the details of the cases. There was no evidence of heredity, and in only 5 cases was there distinct history of syphilis. In 1 case trauma seemed to have been active. In most cases there was no definite etiology. The individual attacks varied in duration from 10 hours to, in 1 case, 2 years; in the latter case the attacks alternated with about 24 hours' freedom from distress. In 2 cases the character of the attacks varied, there being first pain without vomiting; then vomiting appeared, and was the most striking symptom throughout a considerable period; and finally it nearly vanished, and the pain returned again as the most prominent feature. There was nothing characteristic in the condition of the stomach-contents, and the stomach was not found enlarged during the attacks. In 2 cases the attacks were complicated by laryngeal crises; in 2 others by intestinal crises. Basch considers that Benedikt's statement, that the cases of tabes which show gastric crises as a prodromal symptom are of favorable prognosis, is of much importance. In 15 of these cases in which the crises were the initial symptom and had persisted for from 2 to 10 years the preataxic stage of tabes was still present. In treatment morphin was most satisfactory; antipyrin did much good in a number of cases; cerium oxalate and strychnin helped in a few instances to quiet the attacks.

J. M. Clarke² records a case of gastric crises with tabes dorsalis in which the condition of the stomach-contents was unusual, and in which the gastric crises were the only striking symptoms of the disease. The patient, a man of 42 years, had violent attacks of vomiting, which had appeared at intervals for years, and were occasionally accompanied by **hematemesis**, which was once very free. He made no other complaints; but it was discovered that the knee-jerks were absent, the pupils were of the Argyll-Robertson character, and while there was no ataxia and no affection of the bladder, when questioned carefully it was learned that he had for more than a year suffered from moderate lightning-pains in his extremities, these usually disappearing about 2 days after the gastric crises. Contrary to the usual experience, it was found that during the crises his stomach-contents contained absolutely no free HCl. During the intervals, however, there was a marked excess of this acid. Lactic acid was present in abundant quantities during the attacks.

C. C. Douglass,³ in studying a case of gastric crises in **locomotor ataxia**, found that there was during the crises a secretion of a large amount of gastric juice of somewhat lowered acidity. Hematemesis occurred in the case, probably from congestion, and not as the result of ulceration, since in the intervals between the attacks the patient had no gastric symptoms.

L. Kolipinski⁴ describes a case in which severe **hiccough** came on

¹ Arch. f. Verdauungs-Krankh., Band 5, Heft 1.

² Brit. Med. Jour., Dec. 24, 1898.

³ Lancet, Apr. 15, 1899.

⁴ Maryland Med. Jour., Feb. 25, 1899.

in a man who had an alcoholic gastritis. It was finally controlled by energetic **depression of the tongue**.

R. W. S. Christmas¹ cured a case of protracted hiccough by prescribing **nitroglycerin** and spirit of chloroform.

W. B. Thorn² reports the cure of severe and protracted hiccough by the administration of the usual dose of nitroglycerin. H. Guernsey relieved a similar case by the administration of oil of turpentine; and E. M. Simpson caused almost immediate relief by applying **blisters** alongside the third, fourth, and fifth cervical vertebrae, thinking thus to produce some action upon the phrenic nerves.

F. G. Feece³ cured a case of grave hiccough by the administration of a half-teaspoonful of **pure ether**.

H. E. Belcher⁴ reports a cure of obstinate hiccough by a dose of a dram of **ergot**.

Treatment of Chronic Gastric Disease.—W. Fleiner⁵ describes a compound called **chloral b acid**. This is produced by treating cows' milk with chlorin, and subsequently removing the HCl formed. It is an extremely firm combination of chlorin with albumin, and strong reducing-agents do not release the chlorin. But when it was fed to animals which had been deprived of chlorins, it was found that it prolonged their lives and caused marked increase of the chlorids in the urine. Fleiner has found it a valuable preparation in those forms of gastric disease associated with diminution of HCl and weak motility. It did not increase the amount of HCl, but did improve the motility and caused a decrease in the amount of acid fermentation. The improvement seemed to be due to stimulation of the muscular action of the stomach.

J. A. Goldmann,⁶ in discussing the treatment of anorexia by the use of **orexin**, says that he considers it contraindicated in hyperacidity and when there is a lesion of the stomach. In nervous anorexia and in the anorexia of diseases other than those of the stomach he considers it valuable, using always the tannate, which is harmless. Chocolate tablets are valuable for use in children.

Baudoin⁷ describes the results that Robin has obtained from treating gastric fermentation with **ammonium fluorid**. This substance is bactericidal, and at the same time has no unfavorable action upon the digestive ferments and no general toxic action, and he considers the therapeutic results excellent.

H. Reed,⁸ in cases of **gastric anacidity or hypoacidity**, directs the sipping of dilute HCl immediately after a meal. Unless there duction in acid is complete or nearly so, the HCl should be taken only after some time has elapsed subsequent to the meal, in order to allow of partial digestion of the starches. He believes that HCl and pepsin are to some extent actually curative, and that they act as stimulants.

C. D. Aaron⁹ recommends the administration of **hydrochloric acid** in capsules of double thickness, or in a capsule placed in one of larger

¹ Brit. Med. Jour., Mar. 11, 1899.

³ Ibid., Mar. 18, 1899.

⁵ Münch. med. Woch., Jan. 3, 1899.

⁷ Thèse de Paris, 1898.

² Ibid., Apr. 29, 1899.

⁴ Ibid., June 3, 1899.

⁶ Wien. med. Woch., Feb. 25, 1899.

⁸ Jour. Am. Med. Assoc., Oct. 8, 1898.

⁹ Ibid., June 24, 1899.

size. The acid should be introduced by the patient immediately before it is taken.

G. Herschell,¹ in discussing the treatment of diseases of the stomach, states that he has had good results from the use of **electricity**. He applies it externally, considering galvanization of the solar plexus and of the vagi in the neck most important. Atony of the bowels is, he believes, well treated by applying a roller electrode to the abdominal muscles and over the course of the intestine, using interruptions at the rate of 120 to 200 per minute. He also considers **douching** with hot and cold water through a double-current stomach-tube valuable. In hyperchlorhydria he administers large doses of alcohol and gives a diet of carbohydrates which are partially dextrinized. He thinks that the secretion can be controlled somewhat by using preparations of tannic acid.

C. D. Spivak² insists upon the importance of **absolute rest** in the treatment of diseases of the stomach and intestines. In all serious cases he puts the patient to bed, and rests the stomach by insisting upon abstinence from food for at least 1, sometimes 3 or more days, using nutritive enemata if necessary. Poultices are placed over the epigastrium, both for the comfort they give and in order that they may act as a splint for the stomach. He believes that lavage, intragastric electricity, and other mechanical methods of treating diseases of the stomach are used too freely. He believes rest-treatment especially valuable in the gastric and intestinal affections occurring with tuberculosis.

Sørensen and Metzger³ speak of the great difference of opinion concerning the **proper diet** to be used in cases of **gastric hyperacidity**. They have made a number of studies, using 3 forms of diet, one of which was composed chiefly of carbohydrates, another of albumins, and a third was a mixture of these, the caloric value in all cases being about the same. With a mixed diet free HCl appeared in from a half-hour to 2½ hours after eating, and its maximum was attained in from a half-hour to 3 hours subsequent to its appearance. When the diet was almost exclusively carbohydrate free HCl appeared still earlier, and the maximum was reached more rapidly. On the albuminous diet free HCl was discovered in from 1 to 2 hours, and its maximum was reached in 4 hours. There was no greater secretion of HCl when albumins were used, and the amount found was about the same as when the carbohydrates were taken. Therefore the actual effect upon secretion of these diets was about the same; but the smaller volume of the albuminous diet and its more rapid passage from the stomach make it valuable, and large quantities of albumin are usually well borne in hyperacidity. But man cannot live on an exclusively proteid diet, so that a mixed diet really becomes necessary, though the amount of carbohydrates should be somewhat limited, because they must be given in large quantities and are likely to be retained in the stomach, and for these reasons are irritant to the stomach.

F. Voit,⁴ in discussing the **nutritive value of albumoses and peptones**, decides that they are not equivalent to unaltered albumin in nutritive value, and are also likely to cause irritation of the intestines. Even in those cases in which pancreatic secretion is imperfect, cases which are seemingly rare, the use of freshly-digested albumins is better. He

¹ Brit. Med. Jour., Oct. 29, 1898.

² Jour. Am. Med. Assoc., July 30, 1898.

³ Münch. med. Woch., Sept. 6, 1898.

⁴ Ibid., Jan. 31, 1899.

believes that preparations of native albumins, such as nutrose and eucasin, are better borne and more nutritive, the albumoses and peptones being chiefly valuable for their laxative and stomachic effects.

R. Koch¹ reports that **mutase**, a vegetable preparation, rich in proteids, has proved valuable in the treatment of gastrointestinal diseases, and in other affections in which there were disturbance of digestion and difficulty in administration of food. Absorption-experiments showed that when 35 to 50 gm. of mutase were given daily, together with 2000 to 2500 cc. of milk, the absorption of nitrogen and fat was distinctly better than when the milk was given alone, and there was no evidence of irritation of the gastrointestinal tract such as often follows the use of other albuminous preparations. The absorption with rectal administration was extremely good—about 80 %.

B. Finkler² has used **tropon** in doses of 15 to 30 or more grams a day in bouillon, beer, and other preparations, and believes that it is especially valuable when there is disturbance of the gastrointestinal tract and when readily-digestible food is especially needed, as in convalescence from disease or during acute diseases.

Neumann³ has made **metabolic studies of tropon**. He finds that it is a practical substitute for other food-proteids. It was taken without disgust, and caused no alimentary disturbance. H. Schmilinsky and G. Kleine⁴ have investigated metabolism while taking tropon. The substance is rich in proteids, containing about 89 %, and is well absorbed, but not so well as is meat. It did not seem to have any noteworthy influence on the body-weight, the amount of flesh remaining about the same. It did not disturb the digestive tract; but, on the other hand, it did not seem to have any especially useful effect. It was taken without objection, but is not wholly pleasing in taste, chiefly owing to its sandy consistency. They believe it is of value when one wishes to administer a finely-divided nitrogenous food that is of little volume. It may have special value in diabetes. Frohner and Hoppe⁵ have also investigated the metabolism while using tropon, and reach the same result. They suggest that it might be valuable for army use. They make the interesting point that while administering thyroïdin to a case of cretinism tropon largely **decreased** the **proteid-loss** that was being caused by the thyroïd preparation.

Bornstein⁶ has investigated the possibility of **overfeeding with proteids**. He got himself upon a nitrogen-equilibrium on a mixed diet, and then added 50 gm. of nutrose, and found that most of the nitrogen of the nutrose was excreted in the urine, while some was retained, with an increase of body-weight. He decides that the proteids of the body may be increased, within certain limits, by overfeeding with albumins. This may be attempted in cases in which it is desired to render partially incapable organisms stronger and more capable. He recommends nutrose as of value for such a purpose.

B. Laquer⁷ investigated the effect of the **grape-cure** on metabolism,

¹ Centralbl. f. innere Med., June 10, 1899.

² Berlin. klin. Woch., July 25 to Aug. 1, 1898.

³ Münch. med. Woch., Jan. 10, 1899.

⁴ Ibid., Aug. 2, 1898.

⁵ Ibid., Jan. 10, 1899.

⁶ Berlin. klin. Woch., Sept. 5, 1898.

⁷ Centralbl. f. innere Med., Feb. 25, 1899.

using for his investigations a healthy servant. He learned that, given in very large quantities—4 or 5 pounds daily—grape-juice caused diarrhea and increased putrefaction of albumin, at the same time causing increased excretion of ethereal sulphates in the urine. The result of this disturbance was a diminished absorption from the intestine and increased excretion of water, with loss in body-weight. When the seeds and skin were taken with the juice, there was, on the contrary, a tendency to constipation, probably owing to the tannic acid contained in the skins. During this period the man increased in weight. The effect upon the nitrogen-metabolism was to cause some increased retention of nitrogen; there was a coincident increase in weight, due to increase in body-proteids. The uric acid was somewhat decreased, as was the acidity. The excretion of hippuric acid was but slightly influenced, and no antagonism between the excretion of hippuric acid and that of uric acid could be observed.

J. Prantner and R. Stowasser¹ have studied the **effects of sugar** upon muscular exhaustion by adding to their daily food 30 gm. of grape-sugar and registering their muscular power both when the sugar was not taken and when it was. They excluded any effect from personal suggestion by having dulcin given them on those days on which they did not take the sugar, so that they themselves never knew whether they were getting sugar or not. Their results were striking; the 30 gm. of sugar caused always a distinct and sometimes remarkable increase in muscular power, and the feeling of exhaustion after muscular effort was always much less after using the sugar. Further evidence of its effect was seen in the result of the determination of the nitrogen-excretion, the excretion being always much less on those days on which sugar was taken. Examples of this are seen in the fact that in 1 series the nitrogen when sugar was not taken averaged about 21 gm. daily, while when but 30 gm. of sugar were taken it fell to 16 gm. daily. Another instance is seen in a further record, when from between 21 and 22 gm. daily the nitrogen fell, after taking sugar, to 19.7 gm., and continued falling until, 3 days later, it was but 15.3 gm.

W. G. A. Robertson² writes of the importance of **saccharin foods** as articles of diet, at the same time directing attention to the importance of learning the kind of sugar contained in foods before advising their use. For instance, marmalades, preserved fruits, and similar substances contain their sugar in the form of invert-sugar, which is very digestible. Fruits become more digestible by being cooked after the addition of more sugar, the sugar being in this process converted into invert-sugar. Confections are digestible in proportion to the amount of invert-sugar that has been produced from the cane-sugar. Honey is a comparatively cheap and a very readily assimilated form of sugar.

Lilienfeld³ believes that his experiments have demonstrated the practicability of using **grape-sugar by intravenous injection** for increasing the nutrition of patients. He considers the similar use of albuminous food much more dangerous, though it is probable that this may be successfully carried out also.

R. Rosemann⁴ draws attention to the fact that previous investigations of the possibility of **controlling nitrogen-loss with alcohol** have

¹ Centralbl. f. innere Med., Feb. 18, 1899.

² Scottish M. and S. Jour., July, 1898.

³ Zeit. f. diat. u. phys. Therap., No. 3, 1899.

⁴ Deutsch. med. Woch., May 11, 1899.

been faulty in the fact that they have all been undertaken on individuals who were in metabolic equilibrium, and it would be very difficult, by alcohol or other means, to cause a marked nitrogen-retention in normal persons. It was to be expected that these experiments would be negative. He has had Schönesseffen carry out metabolic experiments on a man who was taking an abnormally small quantity of nitrogenous food, the number of calories supplied by the food being also low and being brought beyond the normal by alcohol. There was, however, no distinct evidence of control of the proteid-destruction by alcohol, as the loss of nitrogen sank only 100 mg. per day. Rosemann concludes that the use of alcohol to control tissue-destruction in acute diseases is illusory and is likely to lead to grave errors, since it causes fat-retention; but the nitrogen-loss goes on and the patient is really in worse condition than his appearance indicates. [One experiment upon a healthy man cannot, however, be said to establish a rule for the treatment of sick persons.]

Gastric Ulcer.—A. Krokiewicz¹ reports a case of **multiple gastric ulcers** associated with **absence of HCl** from the stomach-contents. The patient was a woman of 40, who had had gastric symptoms for 18 months, chiefly consisting of emaciation and anorexia. She also had tuberculosis of the lungs. In the early stage HCl was discovered in the gastric contents, but later it disappeared. There was some leucocytosis, and it was believed that there was a latent carcinoma. The patient died from severe hemorrhage a few days after it was found that HCl had disappeared from the stomach-contents, and 30 round ulcers were found in the stomach, none of them being carcinomatous; there was no carcinoma elsewhere. Krokiewicz decides that HCl shows some tendency to disappear from the gastric contents in certain cases of ulcer, particularly when the latter are present in numbers. The disappearance of the acid is of evil omen, since death has repeatedly followed this occurrence. The diagnosis from carcinoma may be assisted by counting the blood-corpuscles; in this case they numbered 4,000,000 to the centimeter, and such a blood-count is practically never observed in the late stages of carcinoma. The ulcers in this case were embolic.

A. L. Benedict,² in discussing gastric ulcer, suggests that its greater **frequency in females** may be the result of their greater liability to gastropnoia and slight dilatation of the stomach. He objects to the use of the stomach-tube in the diagnosis of these diseases, as he believes it is contraindicated if ulcer is strongly suspected.

A. A. Berg,³ in discussing gastric ulcer, objects to most of the previous theories concerning the etiology of this condition, and states that in his view it is due to **stagnation of food** behind a pylorus that has decreased in lumen, usually from the effects of chronic gastritis, and thus prevents the proper passage of the food. The ulcer seems to him to be analogous to those that occur in any hollow viscus if there is obstruction of the outlet, as, for instance, the ulcers found in the bladder behind a stricture of the urethra. [These views are certainly not supported by the postmortem findings usually observed.]

J. L. Steven⁴ records 2 interesting cases of **fatal erosion** of the gastric mucous membrane. In the first case the preceding symptoms of gas-

¹ Wien. klin. Woch., Dec. 1, 1898.

³ Med. Rec., July 30, 1898.

² Med. News, Nov. 26, 1898.

⁴ Glasgow Med. Jour., Jan., 1899.

tric disease had been very slight; in the second there had been practically none; and in both profuse hematemesis was the first symptom of gravity. In both cases this was repeated several times; and in the second case it was the direct cause of death, while in the first death occurred from an exhausting diarrhea after the cessation of hematemesis. In the first case the postmortem examination showed a superficial abrasion only $\frac{1}{4}$ in. in its greatest diameter, and in the center of this were 2 pinhole openings, through which bristles could be passed directly into one of the primary lateral branches of the gastric artery. In the second case there was a slightly larger erosion, in the base of which was an opening into a large branch of the left gastroepiploic artery.

M. Einhorn describes 6 additional cases of erosion of the stomach. The treatment which he found most satisfactory was an **intra-gastric spray** of silver nitrate, 1:1000, careful dieting, and properly regulated exercise.

L. Bouveret² records a case of severe gastric **hemorrhage** from ulcer, which was followed the same day by mild **aphasia**, which on the following day had increased to almost complete inability to articulate, and was accompanied by right facial paralysis with some paresis of the right arm and leg. The next day the aphasia persisted, but the hemiplegia had nearly disappeared. There was some improvement in the condition for a day or two, when suddenly there was an apoplectic attack with complete right hemiplegia, and the patient died. Two years before this time the patient had had gastro-enterostomy performed for stenosis of the pylorus. At the postmortem the operative result was found to be perfect. There was no distention of the duodenum above the point at which the jejunum had been joined to the stomach, and there had been no reflux of bile or other intestinal contents in the stomach, owing to the fact that a portion of the jejunum running horizontally had been attached to the stomach, and this caused the bowel-contents to be carried directly past the opening, and not into it. There was thrombosis of a branch of the coronary artery, and the thrombus extended from this branch into the main trunk of the coronary and into the splenic and hepatic arteries, and into the celiac axis. The brain showed no lesion, excepting severe edema, and the condition is believed to have been serous apoplexy.

Lancaster³ records an instance of **fatal hematemesis from a varix** of the stomach. There was no obstructive cause, such as cirrhosis, found upon postmortem examination; but a large varix was found in the stomach, and in this there was a small orifice, through which the blood had escaped. The gastroepiploic veins in the upper part of the omentum also showed marked varicosities.

Letulle⁴ records 2 fatal cases of **varicose veins** of the stomach, both of which resulted from cirrhosis of the liver. Fatal hematemesis is likely to occur, as it did in these cases; and Letulle explains its production by showing that there is first chronic thickening of the veins, which causes them to become more brittle, then aneurysmal pouches form, and these become eroded through septic infection from the stomach.

M. D. Eder⁵ describes the case of a colored woman of 20, who had

¹ Jour. Am. Med. Assoc., May 20, 1899.

² Rev. de Méd., Feb. 10, 1899.

³ Tr. Clin. Soc. Med., vol. 30, p. 32.

⁴ Presse méd., Nov. 26, 1898.

⁵ Lancet, Feb. 18, 1899.

been vomiting blood practically every day for more than a year, commonly in the morning. She had no distinct digestive disturbance, and there was no disease of the heart or lungs. The diagnosis seemed very uncertain, until it was discovered that there was an **ulcer on the nasal septum**, which probably caused the hemorrhage, as the latter ceased after the ulcer had healed.

Treatment.—M. Einhorn¹ describes an instrument that he has had prepared for **insufflating powder** into the stomach. Powders introduced through this tube may be blown over the whole surface of the stomach, and he states that this has been proved by discovering a shadow over the whole area of the stomach upon using the fluoroscope. The instrument is thought to be useful in treating ulcer, erosions, and hemorrhage, as well as in x-ray examination of the organ.

C. J. Whitby² reports the case of a man who had had repeated symptoms of gastric ulcer, and who finally had a sharp attack of pain, with subsequent symptoms of localized peritonitis, which after some improvement were followed by a violent hemorrhage and profound collapse. More than 2 quarts of **normal salt solution** were given through the median basilic veins, with little immediate improvement; but the patient fell asleep, and after this showed constant improvement, and finally completely recovered.

Poliakow³ has had excellent results in treating a case of severe hematemesis, due to ulcer of the stomach, by the administration by the mouth of a 10% solution of **gelatin**. The hemorrhage stopped on the following day, and, though slight subsequent hemorrhages occurred, they were immediately controlled by further use of gelatin.

Tripier⁴ treats hemorrhage from the stomach, epistaxis, and hemoptysis by using **enemas of hot water** (122° F.) night and morning, with good results.

T. MacHardy⁵ has treated several cases of ulcer of the stomach with **potassium bichromate**. One patient had been a subject of ulcer for 20 years and had become bedridden. The stomach was washed, and $\frac{1}{16}$ gr. of the bichromate given in an ounce of water. It caused severe pain, and necessitated injection of morphin. Nevertheless similar doses of the drug were given repeatedly, each dose being followed by less pain, and within 2 months entire relief of the gastric symptoms had been obtained. He has had beneficial results in other forms of gastric disease in which there was persistent vomiting.

J. Maberly⁶ has used a tincture and a powder, which he has prepared from a species of **pelargonium**, in the treatment of 1 case of chronic dysentery and 1 case of gastric ulcer. The drug comes from a South African plant; the active principle seems to be a reddish amorphous substance, which gives the reaction of the tannins. The effect of this drug was compared with that of monsonia, upon the use of which Maberly has previously reported. He decides that pelargonium is more suitable in cases of ulceration of the stomach and disease of the upper portion of the intestinal tract. Monsonia is valuable in ulcerations in the lower portion of the intestines.

¹ N. Y. Med. Jour., Apr. 1, 1899.

³ Union Pharmaceut., Aug., 1898.

⁵ Scottish M. and S. Jour., Dec., 1898.

² Lancet, June 24, 1899.

⁴ Med. Press and Circ., Aug. 31, 1898.

⁶ Lancet, July 16, 1898.

Changes in Form and Position.—J. J. Putnam¹ describes a case of **splanchnoptosis** associated with **achylia gastrica** and **melan-cholia**. The patient was a man of 70, whose work entailed much exposure. After an attack of influenza he became much depressed, lost appetite entirely, and had severe lassitude. Emaciation came on, and he became gravely ill. The lesser curvature was found at the level of the umbilicus; HCl was absent from the stomach-contents. The relation between achylia gastrica, gastropotosis, and mental disturbance is not uncommon.

A. Stengel and H. D. Beyea² record a case of gastropotosis that occurred in an unmarried woman of 25. Medicinal treatment had failed to give her any relief, as had nephrorrhaphy, which had been undertaken because of the marked movability of the right kidney. An **operation** was therefore done to attempt to **correct the gastropotosis**, the sutures being placed in the gastrohepatic omentum in such a way that, when tied, they shortened this ligament greatly and drew the stomach up near the diaphragm and liver, 2 rows of sutures being placed in the gastrohepatic omentum and the gastrophrenic ligament. By this means the stomach was drawn into almost the normal position, and, although it sank slightly after the patient got well, the operation was a practical success and largely relieved her distress.

A. K. Stone³ finds that most **abdominal bandages** prescribed for enteroptosis cause greatest compression on the level of the crests of the ilia and the anterior superior spine, this tending to compress the intestines downward rather than upward, and to increase the trouble. He insists upon the necessity for care in examining patients wearing these bandages, in order to see that the greatest compression comes just above the pubes.

R. Sievers⁴ reports the case of a woman of 26, who had been treated recently for gastric ulcer, and who was admitted to the hospital with the appearance of perforation of the abdominal organs, with resultant peritonitis. The postmortem showed a severe grade of **hour-glass contraction** of the stomach; a canal about 1 in. in diameter and slightly less length connecting the 2 cavities. In the further cavity, near the constriction, there was an ulcer that had perforated. The mucous membrane of the contracted portion was wholly normal.

L. Bouveret⁵ discusses adhesions of the stomach and the colon under the name of **gastrocolic symphysis**. Bouveret observed 2 cases of gastrocolic fistula, and discusses 60 cases collected from the literature by Bec. The diagnosis is commonly not difficult, being based chiefly upon severe and rapidly increasing anemia and profound lenteric diarrhea. Vomiting occurs at most very infrequently; but nausea and the subjective sensation of vomiting are quite frequent in some cases, and probably at these times the gastric contents are expelled into the colon, instead of through the esophagus.

A. L. Benedict⁶ considers entire recovery in extreme **dilatation** of the stomach very improbable. He, however, reports a case in which there was marked dilatation that was greatly improved by medical treatment. He expresses himself vigorously in opposition to Hemmeter's

¹ Boston M. and S. Jour., Nov. 17, 1898.

² Boston M. and S. Jour., May 11, 1899.

³ Rev. de Méd., Apr. 10, 1899.

⁴ Am. Jour. Med. Sci., June, 1899.

⁵ Berlin. klin. Woch., Apr. 10, 1899.

⁶ Med. News, Mar. 18, 1899.

method of scraping off portions of the mucous membrane with a stomach-tube for the purpose of determining the presence or absence of cancer.

A. Albu¹ reports a case of **tetany, with dilatation** of the stomach, which is interesting from the fact that operation was done, and entire recovery from the tetany ensued. The patient was a man of 34, who had dilatation of the stomach, severe vomiting, and other gastric disorder, and marked emaciation. HCl continuously decreased in amount, and finally lactic acid was present. There was no tumor present, even during necrosis, but a diagnosis of carcinoma was made. Since repeated attacks of tetany came on and seemed likely to cause death, an operation was performed and the pylorus was resected. Improvement in health began almost at once, and the tetany had not reappeared during the 4 months between the time of the operation and the time of the report. Albu therefore advises operation in these cases, although directly the contrary has been advised by Fleiner and others. The motility in this case improved constantly after operation. The lactic acid disappeared, but the HCl did not return. This is similar to the experience of others. Albu believes that an early diagnosis may be established and operation properly advised, if, together with the gastric disturbance and the general symptoms of carcinoma, it is found that the motility of the stomach is constantly diminishing and the amount of HCl continuously growing less, even though the HCl has not yet disappeared and lactic acid is not present.

M. Robson,² in a paper upon **tetany and tetanoid conditions**, with dilatation, reports 3 cases, and refers to others in which he has seen this complication of gastrectasia, and he considers it quite common in the milder forms. In the 3 cases he reports operation was undertaken, and it cured the attacks of tetany. He therefore advises operation in the earlier and milder forms of this complication. Trevelyan doubts whether Robson's cases should be considered true gastric tetany. E. F. Trevelyan³ records 2 cases of tetany, or a condition similar to this, that occurred with dilatation of the stomach, and a third case, in which there was no gastrectasia. The symptoms were not typical of tetany, and the Troussseau, Chvostek, and Erb symptoms were absent; but he believes that all tetanoid conditions that occur with dilatation of the stomach should be classed as of the same nature. In 1 case the gastric dilatation was found to be due to carcinoma of the duodenum. That case in which there was no dilatation of the stomach occurred in a girl, 17 years of age, the attacks in her case being preceded by vomiting and often by diarrhea.

R. Sievers⁴ reports 2 cases of tetany in individuals suffering from dilatation of the stomach, which had resulted from pyloric obstruction, the consequence of old ulcer. Both cases ended fatally, the first dying soon after admission. It was not thoroughly investigated, but a typical position of the hands and feet, and spasms of nearly all the muscles were noted. Typical spasms occurred in the second case, and the Chvostek and Erb symptoms were present. It is said by some that ulcer and hyperacidity always accompany these cases; but there are cases on record in which hydrochloric acid was absent and in which there was no ulceration of the

¹ Arch. f. Verdauungs-Krankh., Band 4, Heft 4.

² Brit. Med. Jour., Nov. 19, 1898.

⁴ Berlin. klin. Woch., Aug. 1 and 8, 1898.

³ Lancet, Sept. 24, 1898.

stomach, and such cases prove the falsity of such a theory. Sievers states, indeed, that stenosis is not necessary, nor is dilatation, as tetany may occur with other gastric affections; but these two conditions existing together give the best opportunity for the absorption of poisonous substances.

R. Kuckein¹ records a case of **latent tetany** that occurred with severe dilation of the stomach, due to carcinomatous stricture of the pylorus. The patient, a man of 48, was admitted while almost entirely unconscious. It was discovered, however, that the Trousseau phenomenon could be elicited, there was some indication of the Chvostek phenomenon, and a faradic current set the muscles into persistent tetanic contraction. Without the use of electricity, however, contractures were entirely absent, and the limbs were flaccid, so that if the case was one of tetany it was a latent form. That such latent forms do occur seems certain to the author, and he mentions 1 case that occurred in a child, in which distinct symptoms of tetany had been present, but all spontaneous signs vanished. Still, for 8 weeks the Chvostek and Trousseau phenomena could be readily elicited. [We have watched a case for a period of several weeks, in which spontaneous contractures were never noted, and seemed from the history to have been almost entirely absent, but the Chvostek, Trousseau, and Erb phenomena were persistently present. The patient was a native of Vienna.] In Kuckein's case the blood-serum was found to contain 11.1% of solids—something of an excess. This speaks slightly in favor of the theory that attributes the disease to thickening of the blood; but, as the author states, it is unimportant testimony, since the increase was very slight. In favor of **an intoxication**, were the presence of albumin and casts in the urine and the evidence, postmortem, of slight nephritis. [But signs of mild nephritis are not uncommon with severe gastric dilatation, and in this case it can scarcely be said that such signs indicate that the tetany was due to intoxication.] J. S. McKendrick² reports a case of dilation of the stomach in which typical attacks of tetany appeared. The fatal illness came on with tingling in the extremities, drowsiness, and vomiting of blood, followed by cramps which were of the characteristic type seen in tetany. Death occurred after 5 days. During this time the urine had been almost suppressed. J. R. Arneil³ describes a case which occurred in a woman of middle age, who had had abdominal pain in spasmodic attacks since her eighteenth year. For 12 years before this report she had had attacks of spasms resembling tetany. She also had occasional attacks of swelling of the subcutaneous tissues, resembling angioneurotic edema. She showed marked enlargement of the stomach, with gastropnoia.

B. Reed⁴ recommends **intra-gastric electricity**, used as a strong faradic current, in cases of dilation of the stomach. Abdominal exercises have also been found very valuable in these cases; rowing, however, being excluded because of the position assumed, and the consequent effect upon the abdominal organs. Reed describes his results in 12 cases of muscular insufficiency which were treated with intra-gastric electricity. In 11 cases there was decided improvement in the motor power and decrease in the size of the stomach. The other case disappeared from observation.

¹ Berlin. klin. Woch., Nov. 7, 1898.

² Lancet, Sept. 24, 1898.

³ Med. News, Apr. 22, 1899.

⁴ Brit. Med. Jour., Oct. 29, 1898.

Renton,¹ in discussing the **surgical treatment** of diseases of the stomach, said that in cases of doubt as to the nature of tumors, the patient should be examined under ether. If, subsequently, the usual treatment does not cause improvement, an exploratory laparotomy should be undertaken. Gastroenterostomy was advised for dilatation which did not yield to medicinal measures and massage, and when the dilatation was due to obstruction at the pylorus, it being essential that the operation should not be too long delayed. Caldwell insisted upon the importance of entire physical and mental rest in treating gastric diseases; and Eccles, in discussing the treatment of atonic dilation, recommended **manipulation of the abdominal wall** several times daily, for the purpose of driving the contents of the stomach into the duodenum; he advised, also, that the patients should assume a position with the buttocks on a higher level than the shoulders, as frequently as they could comfortably do so, in order to prevent the dropping downward, and to help empty the organ. He has found that the stomach will decrease in size, and that the general condition improves and the body-weight increases with this treatment. It is also valuable for gastropnoia.

G. S. Dickinson² describes a case of **benign stenosis of the pylorus** which occurred in a man, 50 years of age. The symptoms came on soon after an injury, though it is not stated whether this seemed to have any relation to the gastric trouble. His condition grew constantly worse, until he underwent gradual starvation from the pyloric occlusion, and before operation could be arranged death occurred. The autopsy showed that the pylorus and the neighboring portions of the stomach-walls were much thickened, the antrum pylori presenting a funnel-like shape. The histologic examination of the tissues from the thickened pylorus showed that they were composed solely of fibrous tissue.

Doyen³ reports a case that was operated on because of the presence of a tumor in the epigastric region. This was thought to be a carcinoma; but operation showed that it was a **permanent contraction of the pylorus**.

Foreign Bodies in the Stomach.—H. Schlesinger⁴ describes a case in which a **mass of hair** was removed by operation from the stomach of a girl of 22. The mass was so large as to fill the stomach entirely; and it had caused considerable pain, without vomiting. It weighed 2 pounds.

Carcinoma of the Stomach.—A. Gordon,⁵ in discussing the **value of the early signs** of early carcinoma of the stomach, expresses his doubt in case the diagnosis is based upon anything less than the presence of a hard, irregular tumor associated with some edema of the extremities, or perhaps with ascites or thrombosis of the veins of the leg. Enlarged glands in the subclavicular, axillary, or inguinal regions are valuable signs, but occur late. The absence of hydrochloric acid or the presence of lactic acid may be observed in other conditions; but in association with other suspicious signs are of distinct value, and when found should always suggest carcinoma. The blood-changes are of value in diagnosis, but their importance is secondary.

¹ Jour. Am. Med. Assoc., July 30, 1898.

² Med. Rec., Mar. 18, 1899.

³ Bull. de l'Acad. de Méd., Jan. 10, 1899.

⁴ Wien. med. Woch., Feb. 11, 1899.

⁵ N. Y. Med. Jour., Sept. 24, 1898.

D. D. Stewart¹ describes an **interesting case** of carcinomatous ulceration of the stomach which occurred in a man of 52, who had first had hyperchlorhydria, and was operated upon for severe hemorrhage. The stomach then, it was reported, was found infiltrated with a growth which extended from the cardiac end almost to the pylorus. Enlarged glands removed at this time proved to be carcinomatous. Great improvement occurred after this operation, but subsequently he grew worse. At the second operation a duodenal fistula was established, and at this time, upon incision of the stomach, the mucous membrane appeared to be normal, except near the esophagus, where there were great thickening and a dense ridge. After death, which occurred 13 days later, 2 carcinomatous ulcers were found, one of them on the lesser curvature, the other on the greater curvature. These showed no connection with each other, and there was no diffuse infiltration of the stomach-wall. The appearance of the stomach at the first examination seems inexplicable to Stewart, unless it was due to contraction of its wall, with a production of folds which looked like malignant disease.

J. M. Clarke² describes a case of carcinoma of the pylorus that presented some **peculiar features**. It began with a violent onset 6 months before death, and there were an area of tympany and a swelling in the upper epigastrium, which gave rise to the suspicion of a subphrenic pneumothorax. The heart was displaced upward, and there was dulness at the lower part of the left lung, with absence of breath-sounds and of vocal resonance; while the liver-dulness on the left was observed by the tympany, which extended to near the nipple-line on the right. No tumor could be felt. Exploratory puncture in the left eighth intercostal space resulted in the production of a pneumothorax. Postmortem examination showed that the stomach was greatly distended, lying upward and to the left, and not extending much downward. It pushed up the diaphragm, and with the distended transverse colon caused the peculiar area of tympany which has been described. The upward dislocation of the stomach was probably due to the presence of a large mass of carcinomatous retroperitoneal glands which lay upon it.

J. Friedenwald and A. S. Hotaling³ record a case of **latent carcinoma** of the stomach which occurred in a colored man, 70 years of age, who had seemed in fairly good health and who had made no complaint. He died suddenly, and the autopsy disclosed a large carcinomatous growth involving both the anterior and posterior portions of the stomach. There was no metastasis.

Treatment.—Géza Koevesi⁴ has studied the alterations in the **gastro-tric secretions, before and after gastroenterostomy**, in a patient who had carcinoma of the pylorus. Before operation there was a total acidity of 79; 0.164% free HCl was present; lactic acid was absent; undigested starch was found; there was much fermentation. The free HCl and total acidity were much decreased 4 weeks after the operation, fermentation was less, and pepsinogen was present in smaller quantity; 5 weeks afterward the free HCl had increased somewhat, while fermentation was less. The dilatation of the stomach that had been present from the beginning was somewhat improved, and the motor activity of the

¹ Am. Jour. Med. Sci., Nov., 1898.

² Lancet, Oct. 1, 1898.

³ Med. Rec., Sept. 24, 1898.

⁴ Münch. med. Woch., Aug. 23, 1898.

organ was decidedly better. Koevesi decides that hyperacidity is largely due to irritation, especially in cases of pyloric stenosis. Also, in this case the starch-digestion improved decidedly after the operation, coincidentally with the increase in HCl; therefore the excess of acid seemed certainly to have interfered with proper starch-digestion. There was no distinct parallelism between the amount of pepsinogen and of HCl.

M. N. Swanow¹ has used with success, he thinks, **chelidonin**, the active principle of *Chelidonium majus*, in the treatment of a case of carcinoma of the stomach that had been doing very badly on other methods of treatment.

Tuberculosis of the Stomach.—H. Claude² reports an interesting case in which the autopsy upon a man who had died of pulmonary and intestinal tuberculosis disclosed a tumor of the stomach, which, upon microscopic examination, proved to be **cancer**; more careful study showed that in the deeper parts of the tumor there were definite tubercles, in which **tubercle-bacilli** were present. At the edges of the ulcerating portion of the tumor the tuberculous process was more marked, and it was apparent that the tuberculosis was destroying the neoplasm. In the muscular layer, which was infiltrated with cancer, there were tubercles undergoing caseation, and there were vestiges of necrotic carcinoma-alveoli. The tumor was considered an adenoma which had become cancerous and had been secondarily affected by tubercle-bacilli in the swallowed sputum, the infection being favored by the diminution of HCl.

J. Petruschky³ reports 2 cases of **gastric ulcer** in which the symptoms had lasted for a long time and had not responded to the usual treatment. He suspected tuberculosis of the stomach, and found that both cases—although showing no signs of tuberculosis elsewhere—reacted to the **tuberculin-test**. Both were treated subsequently with tuberculin, and improved, 1 of them having almost recovered. He thinks this method of diagnosis of great importance in many obstinate cases, and believes that there is a possibility of curing some of these cases by this means.

Syphilis of the Stomach.—S. Flexner⁴ reports an instance of gastric syphilis that occurred in a man, 52 years of age, whose illness began with vomiting and chills, with fever, a **tumor** appearing in the splenic region. The growth enlarged, but subsequently decreased gradually in size. Dropsy of the abdominal cavity and legs appeared, and required repeated tapping. Sudden death occurred, with symptoms of peritonitis. On postmortem this was found to be the result of perforation of the stomach. In this organ there was a large ulcer near the esophageal end of the greater curvature; it was found microscopically to be syphilitic, probably the result of gummatous infiltration of the submucosa, with obstruction of the bloodvessels and consequent necrosis of the mucous membrane. The tumor of the spleen was due to portal obstruction from the syphilitic disease of the liver, the left lobe of which and part of the right lobe were converted into a mass of gummatous nodules.

¹ Medicinskoje Obosrenje, Sept., 1898.

² Compt. rend. de la Soc. de Biol., Jan. 29, 1899.

³ Deutsch. med. Woch., June 15, 1899.

⁴ Am. Jour. Med. Sci., Oct., 1898.

W. A. Mackay¹ expresses his belief that syphilis is possibly a very important factor in the production of **gastric ulcers**, and refers to Fournier's cases, reported a generation ago, adding very brief notes of 2 cases of his own, one in a boy of 15, and the other in a man of 24, both of whom had presented specific symptoms previously, and who had sudden violent hematemesis. In both cases the administration of mercury and iodids caused rapid relief to the vomiting of blood, and the patients were at least temporarily cured. [Unfortunately, the very incomplete notes of these cases give no assurance that they were instances of gastric ulcer, though the occurrence of ulcer as a syphilitic lesion is unquestioned.]

A. A. Jones² considers **gastralgia** to be frequently the result of syphilis. One case is reported in which recovery ensued rapidly upon the use of potassium iodid, though there were no definite signs of syphilis. In a second case, in which there were severe syphilitic ulcers, the use of potassium iodid and mercury brought about entire cure of the gastralgia.

DISEASES OF THE INTESTINAL TRACT.

General Considerations.—H. J. Hamburger³ has investigated the influence of variations of the **intraintestinal pressure** upon the amount of absorption from the intestine, and found that there is no absorption when there is no pressure or it is negative; while, when positive, absorption was increased correspondingly to the increase in pressure. The increase in absorption when the pressure was increased may be seen from the fact that with 10.5 cc. pressure, 1.8 cc. of the salt were absorbed within 3 minutes; while at the highest point experimented with, namely, 23 cc. pressure, 28 cc. of the solution were absorbed in the same time; 0.5 cc. pressure was sufficient to cause some absorption. The important elements in the production of intraintestinal pressure, Hamburger states to be 3—the downward pressure exercised by the diaphragm, as a result of respiratory movements; peristaltic movements of the intestines; and the weight of the stomach and intestines themselves.

A. Fuchs⁴ advises, as a **method of examination** of the intestines, the administration of a glycerin injection of about 10 gm., to empty the bowel, and, when the colicky pains have passed, the injection of about 1 liter of an 8% to 10% salt solution. In this way, he states, peristalsis is increased, the contour of the bowel becomes marked (owing to the contraction of its walls), and the peristaltic movements can be better felt. The bowel can be palpated more readily, and percussion is always more satisfactory. He also states that with this method other organs are more readily examined, the splenic dulness being more sharply limited, the lower border of the stomach coming out more clearly upon percussion, the liver being more readily felt, and the kidneys being pressed backward and subjected to palpation in the loin.

Sahli⁵ renders a further communication concerning the **diagnostic value** and therapeutic uses of his **glutoid capsules**. He has had these prepared in 3 grades; these are dissolved by the action of pancreatin and

¹ Brit. Med. Jour., Dec. 24, 1898.

² Phila. Med. Jour., Apr. 29, 1899.

³ Rev. de Méd., Dec. 10, 1898.

⁴ Zeit. f. klin. Med., Band 36, Hefte 1 u. 2.

⁵ Deutsch. Arch. f. klin. Med., Band 61, Hefte 5 u. 9.

soda in $1\frac{1}{2}$, $2\frac{1}{2}$, and $3\frac{1}{2}$ hours; the former being called weak, the second medium, and the third strong. The best indicator was found to be iodoform; this he encloses in the capsules. In 5 cases in which reaction was much delayed, he diagnosed pancreatic disease; and in 4 found at the autopsy carcinoma of the head of the pancreas, and in 5 obstruction of the duct by metastatic nodules. As to obstruction of the pancreatic duct in icterus, 3 cases of catarrhal icterus were observed, and in but 1 was it delayed; therefore the obstruction seems to lie above the common duct. The reaction occurred within normal time in cases of atony of the stomach. There seemed to be some disturbance of the pancreatic secretion in cases of general infectious disease. When the pylorus was obstructed there was delay. Sahli decides that the capsules have value only when the motor power of the stomach has been found to be normal, and that they chiefly determine the condition of the pancreatic secretion. Therapeutically such substances as pancreatin and alkalis may be carried to the intestines unchanged by using these capsules. Many other uses are suggested.

A. Schmidt¹ has devised a method which he considers useful as a ready **clinical test** of the condition of **intestinal digestion**. He bases this upon his belief that the degree of digestion of starches is a good indication of the general digestive power of the intestine. He puts the patient upon a special diet, using always the same elements in the diet in all patients, in order to have comparative tests. After the patient has become accustomed to the diet, Schmidt takes 8 gr. of the feces and mixes with water, introducing the mixture into a small glass vessel which communicates with an inverted test-tube containing water. The diastase present in the feces will be sufficient to cause saccharification of any starches, and the bacteria present will then cause fermentation of the resulting sugars, and will displace the water in the test-tube into a second communicating test-tube containing air. If at least one-fourth of the amount of water in the first tube has been displaced, and the fermenting mass has become neutral or acid within 24 hours, Schmidt considers, from his investigation, that this indicates that the intestinal digestion is below the normal. A negative result of the test proves nothing.

Schmidt² later contributes a more elaborate paper upon his method of testing the functions of the intestine. The fermentation, he states, occurred as follows in 75 cases taken at random: In 31 there was none; it was weak in 21; moderate in 6; and marked in 17. Of 25 healthy individuals on mixed diet, 8 showed none; 8 slight fermentation; 3 moderate; 6 marked. Those specimens that showed weak fermentation often continued fermenting for 3 or 4 days; while in those that showed marked fermentation this commonly ceased after 48 hours. Some specimens showed no early fermentation, but subsequently did ferment. The soluble portions of the feces do not undergo fermentation unless starch is added. The gases were chiefly CO_2 , CH_4 , air, and N, CO_2 , being present in largest quantities; volatile acids were also formed. In the cases of late fermentation there were, after the first 48 hours, a notable diminution in the amount of CO_2 and an increase in the quantity of CH_4 ; less acid was formed and there was more evidence of putrefaction. This late fermentation seemed

¹ Berlin. klin. Woch., Oct. 10, 1898.

² Deutsch. Arch. f. klin. Med., Band 61, Hefte 3, 4, 5, u. 6.

to be largely in the proteids; while the early fermentation was due apparently chiefly to the presence of carbohydrates. The bacteria most commonly causing fermentation were the colon-bacillus and diplococcus and the streptococcus; while yeasts seemed absent. The variations in the amount of fermentation were due to several causes, among which are the lack of fermentescible substances or of nutriment for the bacteria. Late fermentation indicated a diminution of the power of the intestine to destroy or control the growth of the bacteria. With disturbed digestion, Schmidt found that the CO_2 was diminished in relative quantity and replaced largely by CH_4 . Ordinary constipation or diarrhea seemed to have little effect; but distinct anatomic changes in the mucous membrane caused marked alterations. One abnormal form of fermentation, which was due to decomposition of the carbohydrates, was accompanied by the production of H_2S and of an alkaline reaction. Late fermentation was found to be usually slight when albumins and fats exclusively were used, and the amount of flatus was small, the gas formed being chiefly hydrogen, with a considerable amount of CH_4 . The use of carbohydrates caused a greater amount of late fermentation and an increase in the amount of CO_2 . If the carbohydrates were used in the amount and form common in ordinary diet of nonassimilable nature, there were delay and marked fermentation, with increase of CO_2 and diminution of CH_4 . The amount of fermentation seemed to be in proportion to the amount of gas-formation in the intestinal tract. In 1 case of digestive disturbance resulting from alcoholism he found large amounts of CH_4 and H_2S .

C. A. Herter¹ contributes an interesting paper on the **toxic properties of indol**, as determined by experimental work. When a solution of this substance was injected into the intestines of a rabbit, there were contraction of the pupils and muscular twitching, the latter persisting for several hours. Injection into the femoral vein caused weak heart-action, feeble respiration, and contraction of the pupil, and the animal died in 2 hours. Once recovery ensued. The autopsies showed no characteristic change; chronic poisoning resulted from repeated injections of small quantities; a rabbit that received 10 cc. of a 0.1% solution for 6 days died on the sixteenth day, after severe emaciation. Three men took the substance for experimental purposes, beginning with a dose of 0.1 gm.; one had dull headache and was giddy, and after taking a larger dose on the third day had severe colic and diarrhea. The second had marked intestinal flatulence, headache, and insomnia. The indoxyl-reaction was much increased, and the ethereal sulphates also increased. The third case showed symptoms like those of the first, excepting that they were more severe. All symptoms disappeared when the substance was no longer given. Herter believes that headache may be produced by indol, though more commonly there are merely discomfort and fulness in the head. All cases showed severe feeling of exhaustion; and it is possible that this symptom, which is so common in dyspeptic cases, is frequently due to indol or its derivatives, and that the same substance may finally produce neurasthenia. There was no evidence that indol has marked toxic properties.

F. L. Vaux² discusses the relation between **indol** and its derivatives

¹ N. Y. Med. Jour., July 16 and 23, 1898.

² Jour. Am. Med. Assoc., July 30, 1898.

and **lardaceous change**. He first notes that indol is produced from the proteids of food, and they are thus destroyed during suppuration. He believes that the liver separates tyrosin from its mother-substance, and that in the continuation of this process indol is set free in the liver. In support of this view he mentions the experiments of Nepveaux and Villiard, who found indol and indican in livers after death by using oxidizing agents or alcoholic extraction. He therefore assumes that suppuration causes a rapid increase of the amount of indol in the liver and increased elimination. The difficulties of studying lardaceous change are great, because it is practically impossible to determine definitely that the condition exists during life, and the substance can be studied chemically only with great difficulty. But the amyloid substance is found only with degeneration of tissue and with prolonged suppuration, and there must be some antecedent substance upon which the degenerated cells act. Vaux believes that the antecedent substance is a derivative of indol. He notes that the reaction of amyloid material to iodine may be considered a production of indigo-red from the tissue, through the action of iodine, and that the further action of sulphuric acid produces what may be indigo-blue. These 2 substances are also found after chronic suppuration. Amyloid material yields tyrosin; while the indigo-substances are products of tyrosin. The amyloid substance is found chiefly in the liver, and indol is freely deposited in the liver in suppuration; and it is further noted that the power of yielding the iodine-reaction is lost to the amyloid material by subjecting it to the action of strong potassium hydrate, and that after the action of the same substance a solution of indican will not give the indican-reaction. The course of events is thought to be that indol is deposited in the liver in suppuration, and that the lowered vitality prevents its reduction. Then nitrogenous waste and products of degenerated cells are added, and from all these the amyloid material is finally produced.

A. L. Gillespie¹ believes that autointoxication resulting from **intestinal fermentation** is a very important cause of many symptoms of disturbance of the stomach. He treats this by administering frequent small portions of milk, and dosing with calomel and other intestinal antiseptics. He finds that cheese is valuable in cases of intestinal fermentation if the stomach can stand it.

Diarrhea and Constipation.—F. W. Andrews² investigated an outbreak of **diarrhea** which occurred in St. Bartholomew's Hospital. The stools of the patients affected contained a virulent variety of the **Bacillus enteriditis sporogenes** of Klein; the infection seemed to be through the use of rice-pudding which contained this bacillus.

Carlier³ saw severe **infection of the bladder** occur in several cases during the course of diarrhea. In 1 case this had occurred twice, the attacks having been 7 years apart.

K. Faber⁴ records 3 cases in which severe and protracted diarrhea occurred, believed to be due to the presence of **undigested fish-bones** in the intestine. In the first case these were finally passed, and the difficulty ceased. The second case was in a weak-minded hemiplegic. In this instance quite severe hemorrhage occurred, and there was dis-

¹ Edinb. Med. Jour., Nov., 1898.

² Lancet, Jan. 7, 1899.

³ Méd. mod., Oct. 22, 1898.

⁴ Berlin. klin. Woch., Aug. 29, 1898.

charge of mucus and pus after a rectal exploration and removal of some of the bones. Death occurred in this instance, and there was found a severe purulent proctitis. The third case was observed in a woman of 35, who died with miliary tuberculosis. She had had abdominal distress, with tenderness and diarrhea. The postmortem showed a mass of agglomerated undigested fish-bones. In 1 case the gastric contents were subnormal, while in the other 2 the gastric contents were normal and there was no evidence of insufficiency of the pylorus. He decides that usually small bones are digested in the stomach, though that this sometimes does not occur, even with normal gastric contents. When the gastric secretion is imperfect the bones are usually undigested, but are commonly passed without causing harm; or if in some cases they collect in the cecum or rectum, they give rise to serious chronic disease of the intestine, commonly producing chronic diarrhea, and sometimes hemorrhages. Two other cases are reported in which fish-bones were found; in one case in the intestine after death; in the other case they were passed after considerable distress, and with their extrusion the symptoms ceased.

W. Murrell¹ considers **oil of cajeput** the most valuable of all drugs in the treatment of excessive fermentation in the gastrointestinal tract.

W. MacLennan² discusses the value of **alginic acid** and its salts. The substance is prepared from algæ. Its salts are but slightly affected by the gastric juice, and may therefore prove of importance in the treatment of diseases of the intestine. Iron alginate contains about 11% of iron, is tasteless, and is therefore said to be taken readily by children; it is also nonirritating, and hence has proved of value in the treatment of chlorosis when the stomach was irritable.

G. J. Monroe³ believes that oatmeal, when habitually used, tends to cause constipation; and he reports a number of cases illustrative of this statement.

R. Hutchison⁴ has investigated the **nutritive value of petroleum emulsion**. He found, however, that all of this substance administered by the mouth was recovered in the feces, and he considers it of no value in nutrition. He thinks, too, that it has no action upon the lungs, but it is possible that it might aid in treating constipation and be useful as a vehicle for administering intestinal antiseptics, since carbolic acid, for instance, will dissolve in it, and the petroleum might prevent its absorption and cause it to act only locally in the intestine.

G. R. Lockwood⁵ discusses the **nonmedicinal methods** of treating constipation. He reports 1 case, which occurred in a woman of 48, who had ptosis of the stomach and colon and had been constipated for years, but who recovered entirely after the use of irrigations of oil made every 5 days.

Schellong⁶ describes excellent results from the treatment of chronic constipation by a **special method of using injections**. A half-liter of water at room-temperature is injected in the evening. The patient drinks strong coffee in the morning and eats bread and honey. Throughout the remainder of the day a mixed diet, including rye-bread, is given. Within 4 weeks recovery usually occurs; but if not, water is allowed repeatedly

¹ Med. Press and Circ., Jan. 25, 1899.

³ Lancet-Clinic, Mar. 11, 1899.

⁵ Med. News, Dec. 10, 1898.

² Glasgow Med. Jour., July, 1898.

⁴ Brit. Med. Jour., Mar. 25, 1899.

⁶ Therap. Monats., Nov. 11, 1898.

to run into the rectum and out again, and subsequently a cold-water injection is given.

S. Grunpet¹ observed the occurrence of headache, nausea, and marked dryness of the skin after the use of intestinal irrigations of **boric acid**. This occurred repeatedly after the irrigation, and disappeared after their use was stopped.

R. B. Wild² reports 2 cases of widespread dermatitis which resulted from the use of boric acid. In 1 case death occurred subsequently from uremia resulting from alcoholism; and the author notes that Fère has directed attention to the danger in the use of borax in patients with disease of the kidneys. Boric acid was administered to 40 cases, and the effects watched; and in 1 case, that of a man of 70, who took 80 gr. within 24 hours, albuminuria and redness of the skin were observed at the end of 4 weeks. The albumin had not been present before the use of the boric acid, and it disappeared after it was discontinued. Wild himself had some toxic symptoms after using 120 gr. of the drug within 4 hours, and free boric acid was found in the urine. There are 2 kinds of poisoning from this substance: One the rapid form, in which a good deal of the drug is quickly absorbed and causes disturbance of the gastrointestinal tract, skin-rashes, prostration, and paralysis, and sometimes death; the other form results from a long-continued administration of small doses. In these cases the kidneys are especially to be watched, since uremia is the chief danger.

Enteritis.—H. Roges³ states that Robert, in studying **choleric-form gastroenteritis**, found a **toxin**, insoluble in alcohol, in the stools. Injected into rabbits, this caused severe diuresis and diarrhea, convulsions, nystagmus, and hypothermia, followed by high fever if the animal lived. In 1 very grave case of cholera morbus with cyanosis, coma, cold skin, and imperceptible pulse, saline injection into a vein resulted in entire recovery. He notes 1 interesting case in which apoplexy with hemiplegia came on during a choleric-form gastroenteritis. The autopsy showed acute arteritis, with gelatinous plaques in the aorta and thrombosis in the left Sylvian artery, with consequent softening of the brain.

Colitis and Dysentery.—J. M. Lawrie⁴ reports a case of membranous colitis in which an **artificial anus** was made and allowed to remain open for 9 months. The patient during this time, while under treatment, recovered entire health, when the anus was closed. Other observers have reported similar results. The value of this treatment depends largely upon the length of time the anus is allowed to remain open.

M. Einhorn,⁵ in a general discussion of **membranous enteritis**, states that in 12 cases of this disease he discovered enteroptosis. Of these, 5 showed entire absence of gastric secretion, while 1 had hyperchlorhydria. The motor function of the stomach was not diminished in any case, while in 8 it was excessive. His treatment consists chiefly of warm poultices over the abdomen and warm-water enemas during the attack; during the interval he gives abundant solid food in preference to

¹ Brit. Med. Jour., Jan. 7, 1899.

² Lancet, Jan. 7, 1899.

³ Rev. de Méd., May, 1899.

⁴ Brit. Med. Jour., Nov. 5, 1898.

⁵ Med. Rec., Jan. 26, 1899.

liquid food, and uses daily oil enemas in quantities ranging from 200 to 500 cc., beginning with the former amount.

D. A. Rose¹ describes a case of membranous enteritis which occurred in a woman of 42. Large amounts of mucus were passed suddenly after protracted constipation, and the condition recurred. At one time casts of the bowel, one 8 in. and the other 10 in. in length, were passed. Careful dieting with the purpose of limiting the amount of residue, together with boric-acid enemas and arsenic, finally brought about entire cure.

Dysentery.—Ascher² studied a number of cases of dysentery, and injected portions of the stools into the intestines of cats. These experiments had practically negative results, excepting in 1 case in which **streptobacilli** were found in the blood and organs of an animal after its death. The other animals showed no peculiar changes. In no case were amebas found. In one instance, when a bouillon-culture of the streptobacilli was injected into the intestines of a cat, it caused death, with clinical appearance of a severe dysentery, and the organism was obtained from the blood and organs of this animal; 4 other such injections were negative, however, and although this same streptobacillus reacted to a very high dilution of the blood-serum of patients with dysentery, it was found that it reacted to quite as high a dilution of the serum from patients who had no dysentery. Ascher has also endeavored to learn what the typical bowel-flora are. After repeated cultures, however, and learning that with nearly every culture he obtained new microorganisms, he gave up the attempt, with the conclusion that the endeavor to find any typical flora was fruitless, since the variations are so endless.

E. Henry³ records an interesting **family epidemic of dysentery**. The father was first affected. During his convalescence the wife became ill, and 2 children, one 5 years of age and the other 14 months old, both acquired the disease. The elder child had been in the house throughout the illness of his parents; while the younger child had been removed for 2 weeks, but subsequently returned and soon developed dysentery. The grandmother also had the disease. The mother and the grandmother had septic arthritis with it.

W. J. Buchanan⁴ presents statistics to show that **dysentery in prisons** has greatly decreased in mortality in recent years. Abscess of the liver has become extremely rare in the Bengal prisons, but 1 case having been seen in 10 years.

P. Remlinger⁵ describes 2 cases of dysentery in which **swelling in various joints** occurred. The first patient was convalescent when pain in the right knee occurred, and this was followed by swelling without elevation of temperature. Glairy fluid was withdrawn from the joint upon puncture; later the left ankle-joint swelled. The knee continued to grow worse, and 65 cc. of fluid were removed by puncture. This was followed by improvement, and entire recovery finally ensued. Neither bacteria nor amebæ were found in the fluid, and inoculation-experiments were negative. The second patient had pain in the right wrist on the ninth day of the disease. There was swelling of the wrist, followed by

¹ N. Y. Med. Jour., Dec. 10, 1898.

² Deutsch. med. Woch., Jan. 26, 1899.

³ Brit. Med. Jour., Apr. 1, 1899.

⁴ Ibid., Sept. 24, 1898.

⁵ Rev. de Méd., Sept. 10, 1898.

a similar condition in the right shoulder and then in the left ankle. This continued, with slight improvement, until the thirty-fifth day of the disease, when both knees became painful and much swollen. Ten days later, since improvement had not occurred, the fluid was removed from both joints, this operation being followed by rapid and complete recovery. The bacteriologic and chemic examination in this case was the same as in the other, negative results being obtained. The joint-inflammations are believed by Remlinger to be due to the action of some toxin. The fluid contained a large quantity of fibrin, and coagulated spontaneously.

E. R. LeCount¹ describes a case of dysenteric diarrhea which ended fatally; death being preceded by delirium alternating with stupor, and the disease becoming complicated 3 days before death by **noma of the lower lip**. Postmortem, amebæ were found in large numbers in the bowel; in the necrotic tissue about the gangrenous stomatitis there were swarms of short, slender bacilli, which stained by Gram's method.

F. M. Sandwith² uses a solution of **copper sulphate**, in the form of enema, in treating acute dysentery, beginning this treatment early in the case and accompanying it with other symptomatic treatment. Osler, in discussion, objected to treatment with enemas, owing to their producing severe pain, which is usually followed by pronounced exhaustion. Ewart, who has compiled statistics from the records of the armies in India, thinks that there has been a great reduction of the death-rate as a result of the treatment by enemas.

J. J. Day³ compares his results in the treatment of 25 cases of dysentery with **ipsecac and opium** with those obtained by treating 35 cases with **magnesium sulphate**. In the former series the death-rate was 32%, in the latter 2.9%; and besides decreasing the death-rate remarkably, he states that the magnesium-sulphate treatment was accompanied by much more rapid and more complete recovery. He continues the use of magnesium sulphate for some days after the stools have ceased to be dysenteric.

H. J. Walker,⁴ in a case of severe dysentery in which sudden heart-failure came on, injected a liter of **salt solution** into the subcutaneous tissues of the abdominal wall; marked improvement ensued almost at once, and after a second injection of a half-liter recovery occurred.

W. Stewart⁵ finds **ammonium chlorid** of value in the treatment of tropical dysentery, especially when the disease is accompanied by disorders of the liver.

Appendicitis.—W. B. Small⁶ directs attention to the **importance of injury** in the causation of appendicitis. He reports a number of cases of his own, and others communicated to him verbally by fellow-practitioners or discovered in the writings of other authors, in which an attack of appendicitis occurred soon after an injury in the region of the appendix. The muscular strains and contractions occurring in severe work, he believes, have also a great deal to do with the more frequent occurrence of the disease in the male sex. He believes that insurance societies should pay damage for appendicitis occurring as the result of an injury.

¹ Phila. Med. Jour., Dec. 17, 1898.

³ Ibid., Feb. 4, 1899.

⁵ Ibid.

² Brit. Med. Jour., Sept. 24, 1898.

⁴ Ibid., Sept. 24, 1898.

⁶ Med. Rec., Sept. 10, 1898.

Nimier¹ reports 4 cases of appendicitis in which the symptoms appeared shortly after **abdominal traumatism**.

L. Herzog,² in discussing the treatment of appendicitis adopted in the Bethanien Hospital in Berlin, after an experience of several hundred cases, speaks in praise of the **routine use of opium**, particularly for the purpose of decreasing peristalsis, and thus quieting the irritation of the appendix, and also, perhaps, preventing rupture of recent delicate adhesions that may be forming in the attempt to wall off pus.

E. Lee,³ in the treatment of appendicitis, uses practically no medicine, and depends upon repeated **irrigations of the colon** with 2 or 3 quarts of water, free use of water internally and, for fever, externally.

Duodenal Ulcer.—H. D. Rolleston⁴ details the case of a man of 32, who was attacked with sudden anuria and abdominal pain, with distention of the abdomen and disappearance of the liver-dulness. The patient was in collapse and soon died. At the autopsy there was discovered a **ruptured duodenal ulcer**; the appendix was curved, and old adhesions had fixed it beneath the cecum. On opening the latter, the mucosa of the appendix was found to be projecting for about $\frac{1}{2}$ inch into the cecum, the projecting portion being very firm, owing to the presence of a concretion within it. Microscopic examination showed that the projecting mass consisted of the mucosa and submucosa; and Rolleston believes that the fecal concretion had caused irritation of the appendix and the consequent protrusion of a portion of the walls in an endeavor to expel the concrement.

Dilation of the Colon.—P. S. Hichens⁵ describes the case of a man of 20, who had been obstinately constipated since birth, having always been obliged to induce bowel-movements by the use of laxatives or enemas: defecation was often followed by nausea and semicollapse. He had enormous distention of the abdomen. Death occurred very suddenly, without apparent cause. At the autopsy the abdomen was found almost entirely occupied in the anterior portion by the enormously **dilated sigmoid flexure**, which appeared like 2 enormous cylinders, running at first upward under the ribs, then doubling on itself and passing downward again. Fourteen inches from the upper end there was the cicatrix of an ulcer which had caused a slight relative constriction, the circumference above this being 10 in., below it 14 in., at the seat of the contraction $7\frac{3}{4}$ in. There was much thickening of the walls of the bowel, which proved to be the result of hypertrophy of the muscular layers. The case is believed to be one of idiopathic dilatation of the colon.

F. Göppert⁶ describes a case of **congenital angulation of the large intestine**, and lays especial stress upon the role of such a condition in the etiology of so-called congenital or idiopathic dilatation and hypertrophy of the colon. This patient was a child of 5 weeks, who was dangerously constipated and had an enormously distended abdomen. Upon introduction of his finger into the rectum, Göppert found that about the promontory of the sacrum there was a sudden bend of the bowel, and above this a large cavity containing a collection of feces and gas. The case was

¹ Gaz. hebdom. de Méd. et de Chir., Jan. 1, 1899.

² Zeit. klin. Med., Band 36, Hefte 3 u. 4.

³ Jour. Am. Med. Assoc., Sept. 10, 1898.

⁴ Edinb. Med. Jour., July, 1898.

⁵ Lancet, Oct. 29, 1898.

⁶ Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

entirely cured ultimately by introducing a catheter, first temporarily, and then, since this was insufficient, keeping it constantly in for a period of weeks, in order to keep the cavity drained. At the time of the report, the child was a year old, was in good health, and had no abnormality of its bowel-action, except that it required enemas. It had no meteorism. He has studied the other cases of dilation of the colon reported, and the conditions observed in them, and believes that in many of them there is direct evidence of angulation of the bowel as the primary cause. The effect of this, he explains, as does Roser, by showing that there will be a tendency for the wall of the bowel that forms the internal angle at the bend to be pressed downward against the lower portion of the wall forming the external and wider angle, and thus to cause obstruction and consequent dilatation and hypertrophy. [We have reported a similar instance in an older child, and the same explanation was given, owing to the fact that the patient recovered entirely after overcoming the obstruction produced at the point of angulation.]

J. R. Linn¹ describes 2 cases of what he terms **idiopathic dilation of the colon**, both of which occurred in women of advanced years. In the first, both the colon and rectum were found largely distended, without any evidence of stricture, compression, or fecal accumulation; in the second case the rectum was found greatly distended, without any apparent causative lesion.

J. B. Shober² reports the discovery during operation of an **anomalous position of the sigmoid flexure**, this portion of the bowel being found in the right iliac region. It is believed to have been a case of excessive development of the colon. The article is accompanied by a review of the literature.

Carcinoma of the Intestine.—P. M. Rewidzoff³ records a case that was believed to be one of stenosis of the duodenum below the papilla of Vater, because of the history of dyspeptic disturbances followed by severe pain in the epigastrium, violent attacks of vomiting with pain, the repeated presence of blood in the vomitus, the presence of dilation of the stomach with visible peristalsis, and the very frequent presence of bile in the vomitus and in the stomach-contents obtained by expression. The latter indicated that there was an obstruction to the outflow of the stomach-contents, but that this obstruction was beyond the point at which the bile flows into the intestine. Operation confirmed this diagnosis and disclosed a carcinoma below the papilla. A gastroenterostomy was performed successfully, and the patient recovered entire health.

C. D. Aaron⁴ reports an instance of **colloid cancer** of the duodenum, which was situated about 4 cm. below the pylorus, and was therefore above the common bile-duct. The symptoms produced by this growth had been those of stenosis of the pylorus.

H. Kerr⁵ reports a very unusual case which occurred in a woman of 66, who suddenly showed a **subcutaneous emphysema** which reached from the axilla to the iliac region over the whole left side and back. Death occurred 7 days after the onset of the trouble, and without the discovery of the cause: but the postmortem examination showed

¹ Lancet, Mar. 11, 1899.

² Am. Jour. Med. Sci., Oct., 1898.

³ Arch. f. Verdauungs-Krankh., Band 4, Heft 3.

⁴ Phila. Med. Jour., Feb. 4, 1899.

⁵ Lancet, Nov. 26, 1898.

a cavity in the abdominal wall which communicated with the sigmoid flexure and contained feces and air. This had resulted from ulceration of a new growth in the intestine at this point. The malignant disease of the intestine had caused severe stricture of the bowel, without having produced any notable symptoms previous to the occurrence of the emphysema.

Phantom Tumor.—B. K. Hays¹ describes the unusual occurrence of a phantom tumor in a man of 40, who was a melancholiac. He presented the appearance of deep-seated nodules in both lumbar regions; but these disappeared entirely under the use of chloroform.

T. E. Gordon² describes a case of **vanishing tumor** in a man who had previously been operated on for hernia and who had been the subject of syphilis. The tumor began in the left flank, and became so extensive as to reach nearly to the umbilicus, and seemed fixed. Some months later it showed decrease in size, and within about 6 months it had disappeared altogether.

Strauss³ describes a case of **hysteric** simulation of **stenosis of the intestine** which occurred in a shoemaker 29 years of age. He had been severely injured by being thrown from a horse. Subsequently there was for years obstinate constipation, and twice it so closely resembled intestinal obstruction that eeliotomy was done, but no stenosis was found. Afterward there was again an appearance of obstruction, with extreme tympany, sometimes retention of urine, obstinate constipation, and frequent vomiting, the latter never, however, being steatorrheic. The patient had an evident hysteric attack, and presented anesthesia, astasia-abasia, and other typical symptoms, and the meteorism entirely disappeared during an hysteric outbreak. The factors active in the production of hysteric meteorism are described as being enterospasm, enteroparalysis, paresis of the abdominal muscles, and sometimes swallowing of air, associated with insufficiency of the pylorus.

Tuberculosis of the Intestine.—K. G. Lennander⁴ records a case of a woman of 37, who had **multiple tuberculous stenoses** of the intestine. Her illness began with symptoms resembling appendicitis; pain and tenderness in the region of the appendix, and vomiting without diarrhea occurred repeatedly, and the appendix was removed. Some relief followed; but the symptoms returned, and her health declined constantly. Laparotomy was again undertaken, the intestine being found stenosed in 4 different places, all of them being within about 18 in. of the ileocecal valve. The affected portion was removed, and the ends of the bowel united by a Murphy button. On the inner surface of the intestine there were found in one place a ragged-edged ulcer of considerable size and several smaller ulcers; microscopic examination showed that the condition was tuberculous. The most severe stricture was but 2 cm. in diameter. The Murphy button was not passed, and 2 years later she was again operated upon for symptoms which resembled gallstone; none was found, however, but it was discovered that there were adhesions between the omentum and transverse colon, the latter being tightly bound down. The Murphy button was discovered in a diverticulum which had formed just above the point of anastomosis. The diverticulum was extirpated,

¹ Med. Rec., Oct. 8, 1898.

³ Berlin. klin. Woch., Sept. 19, 1898.

² Brit. Med. Jour., Apr. 15, 1899.

⁴ Ibid., Aug. 8, 1898.

and the bowel was united by end-to-side anastomosis. Entire recovery ensued. The patient never presented signs of tuberculosis elsewhere.

Claude¹ describes a case in which for 5 months there was a dysenteric diarrhea, with discharge of blood, much mucus, and at times membranous-like structures. Carcinoma of the rectum was suspected; but the postmortem showed a tuberculous infiltration of the large intestine, with a loss of large portions of the mucous membrane from the cecum and colon, and the entire mucosa of the rectum.

Actinomycosis.—Dolore² records a case of actinomycosis of the anus, the first described as yet in France. The man had had an ischio-rectal abscess 20 years previously, but this had gotten rapidly well, while 10 years later he had marked dysuria and hematuria, and hemorrhage from the bladder, together with pain in defecation. It was found that he had fistulas and fungous masses about the anus and in the region about the neck of the bladder. The infection was thought to have been acquired 20 years before.

DISEASES OF THE PERITONEUM.

J. C. Wilson,³ in opening the discussion upon **perforation-peritonitis**, drew attention to the important position which surgical treatment has attained in this disease. He especially insisted that physicians are less advanced in treating this condition than are surgeons, and are less ready in making a prompt diagnosis and in turning the case over to the surgeon for prompt operative treatment. He affirmed that observation of the pulse and temperature is an unreliable method of diagnosis, and believed that the most important symptom is **rigidity of the abdominal walls**. He insisted that operation must be undertaken within 24 hours after perforation, or the case might become hopeless. W. W. Keen, in discussion, agreed that the pulse and temperature are uncertain signs of abdominal sepsis, and that rigidity is a sign of great value. He also insisted upon early operation, and advised 2 incisions with through-and-through flushing and wiping the intestine as clean as possible, in order to obtain thorough cleansing of the abdominal cavity. J. H. Musser dwelt upon the importance of a careful study of the previous history in obscure cases. In typhoid fever he considers the appearance of distinct abdominal pain a grave symptom, and one that should always make one fearful of possible oncoming perforation. C. G. Stockton, in speaking of the local diagnosis, drew attention to the fact that in perforation of hollow viscera, such as the bladder or the stomach, the course is usually very acute and violent; while rupture of the solid organs or of abscesses forming in these organs is usually preceded by less violent and less distinctive symptoms, so that abruptness of onset indicates perforation of a hollow viscus. The localizing diagnosis, however, is often difficult, as was seen in a case of his own, in which the local symptoms all pointed to perforation of the bladder, while the autopsy showed that the perforation was of the stomach. F. Billings made the important point that abdominal rigidity may be absent, and yet, especially in cases of disease of the pelvis, rectal examination will dis-

¹ *Compt. rend. de la Soc. de Biol.*, Dec. 3, 1898.

² *Lyon méd.*, July 10, 1898.

³ *Jour. Am. Med. Assoc.*, July 9, 1898.

close **rigidity of the pelvic muscles**, which is a sign of great importance. H. J. Herriek spoke in favor of the use of opium in those cases. J. C. Wilson answered emphatically that in most of the cases that he saw the patients died because they had been drugged with opium by the attending physicians until all possibility of saving them had passed.

G. G. Eitel¹ reports a curious case, in which there was marked ascites, which was repeatedly tapped, and in which he discovered a **large tumor** in the upper part of the abdomen. Upon operation this was found to be the **omentum**, tightly rolled upon itself, thus constricting the veins and interfering with the circulation. It was unrolled, and the entire difficulty was thus controlled. The patient had carried a heavy load of mill-product in a quartz-mill, pressed the box which contained this product against his abdomen, and thus caused continuous pressure upward and inward.

J. M. Finney² records a case of **malignant tumor of the mesentery**, in which the only marked symptom during life was enormous ascites, the effusion being hemorrhagic and recurring repeatedly after tapping. The case closely resembled cirrhosis of the liver, excepting for the presence of blood in the effusion. Clinically the liver seemed small; the tumor was exceedingly vascular, and the blood had escaped from its surface by capillary oozing.

J. E. Miller³ reports a case in which operation demonstrated the existence of **tuberculous peritonitis**. The patient improved greatly after operation; but some months later had symptoms which were believed to be due to carcinoma of the stomach. He died about 3 months after these symptoms appeared; no autopsy was obtained, but the case is reported as a combination of tuberculosis and carcinoma.

DISEASES OF THE LIVER.

General Considerations.—Royer and Garnier⁴ have brought forward a method of **determining the functional condition of the liver**. They introduce into the rectum of rabbits 9 to 10 cc. of hydrogen-sulphid gas, or inject about half this amount beneath the skin, and then test the expired gas with lead-acetate paper. They state that in a normal rabbit it would take about the amount mentioned to give a reaction; while those poisoned with phosphorus will react to a much smaller quantity. They think the method might be used clinically. It depends upon the fact that normally the liver arrests large quantities of hydrogen sulphid.

A. Posselt⁵ gives an elaborate study of the **relation between the liver and spleen**; and considers the index derived from dividing the size of the spleen by that of the liver one of considerable importance in diagnosis, both clinical and pathologic. The excess of the size of the liver over the spleen is greatest in carcinoma, and becomes constantly less through a series of diseases, among which may be mentioned echinococcus and hypertrophic cirrhosis toward the one end, and splenomegaly with cirrhosis of the liver toward the other end. [It must be remem-

¹ Med. Rec., May 20, 1899.

² Dublin Jour. Med. Sci., Jan. 2, 1899.

³ Med. Rec., Apr. 29, 1899.

⁴ Compt. rend. de la Soc. de Biol., July 2, 1898.

⁵ Deutsch. Arch. f. klin. Med., vol. lxii., Nos. 5 and 6.

bered, however, that there are practical difficulties in the way of the determination of the exact size of the organs mentioned.]

J. Pichler¹ states that, with a good light and with the patient properly placed, one may see the edge of the normal liver during deep abdominal breathing, and even the position of the notch may be observed. Thus, the size of the organ may often be determined by this method.

M. Litten² agrees with Pichler that the position of the edge of the liver and its movements can be determined very satisfactorily by observing the shadow, which is seen to move up and down upon respiratory effort. It is best seen in patients who are not too fat, and is marked in proportion to the sharpness and thinness of the lower edge of the liver.

M. Mosse³ has used ordinary ox-gall in investigating the question of the powers of the **bile in preventing decomposition** and bacterial growth. He hoped to make his investigation of some clinical value, if this substance were found to have any notable effect, since it is cheap and readily obtained. It caused, however, some increase in the products of decomposition when solutions of peptone were infected with cultures of *Bacillus coli communis*, and also caused an increase in the fermentation of sugars; but it limited the growth of bacteria. It is suggested, therefore, that it might be of value in intoxications by limiting the bacterial growth, but the products of decomposition must be got rid of at the same time by administering cathartics.

A. Biedl and R. Kraus⁴ record some extremely interesting experiments upon the **effect of bile upon the central nervous system**. The experiments consisted of injecting bile beneath the dura, and the effects were exactly like those which resulted from injury of the nodus cursorius; the animals soon beginning to run at the top of their speed, and continuing until exhaustion caused them to fall to the ground, when the running movements of the extremities persisted, somewhat resembling convulsions. This scene was often repeated 2 or 4 times. If extremely large doses—namely, 0.5 to 1 cc.—of undiluted bile were injected into rabbits, death commonly followed within an hour, with severe convulsions. After the smaller doses the animals were commonly found dead within 24 hours. Meanwhile there was a secondary stage of the poisoning, which was also typical, and consisted of clonic convulsions of the eye-muscles and of the muscles of mastication, opisthotonos, nystagmus, and rolling of the eyeballs, together with free secretion of saliva. From further experimentation they determined that sodium taurocholate and glycocholate were the active ingredients of the bile, the taurocholate being about twice as powerful as the glycocholate. Numerous other substances, of which morphin, atropin, organic extracts, and urea are examples, were entirely unavailing to produce these symptoms. The injection of bile into the circulation causes hemoglobinuria, bile-salts appear in the urine, the pulse becomes slow, and the blood-pressure sinks; but none of these symptoms is seen after injection into the cranial cavity: hence there seems to be some affinity between the brain and the bile-salts. This cannot be considered a simple chemical antidotal action, however, since symptoms were produced by the fluid obtained after rubbing bile and fresh brain-substance together, these symptoms being exactly the same as those produced by pure

¹ Centralbl. f. innere Med., Sept. 10, 1898.

² Ibid., Oct. 1, 1898.

³ Zeit. f. klin. Med., Band 36, Heft 5 u. 6.

⁴ Centralbl. f. innere Med., Nov. 28, 1898.

bile. It is evident from these experiments that the bile-salts cause the nervous symptoms that appear in **cholemia**. Comparing the amounts of icteric urine and of sodium taurocholate necessary to produce the symptoms in a rabbit, they decide that the amount of taurocholate in each centimeter of urine must be from 1 to 5 mg.—a much larger amount than is estimated by chemical methods. The latter methods are, in their belief, less trustworthy, because the complicated procedures used destroy considerable quantities of the bile-elements.

J. Bruno¹ found that intracerebral injections of minute quantities (1 to 6 mg.) of morphin caused severe clonic, followed by tonic, convulsions, which rapidly ended in death. The same was true of sodium ferrocyanid, which was inert when taken otherwise. Violent symptoms of poisoning followed small doses when administered in this way. Injection of small amounts of fluid, such as salt solution and urea solution, caused no symptoms. It is evident from this that direct intracerebral injection causes very different symptoms from those produced by poisoning through the circulation; and Bruno believes that the work of Biedl and Kraus on cholemia is therefore of, at best, doubtful value.

Icterus.—E. H. Pomeroy² describes an **epidemic of jaundice** that occurred in Calumet, Mich., in the summer and fall of 1897. In this town and the surrounding country there were about 675 cases, most of them in children under 8 years of age. The mortality was very variable; in the village of Martinique there were 20 deaths among 30 cases, while no deaths occurred in Calumet. The drinking-water was pure, and there was no known source of infection; but the disease was distinctly contagious and spread from individuals to their neighbors, and the persistence of the disease in 1 house or in 1 room seemed to increase its virulence, the later cases usually being more severe. The jaundice was usually of but short duration, commonly about 4 days. If recovery ensued, there were generally no immediate sequel, excepting that in adults, during the disease or in the later stages after the jaundice had come on, there were attacks similar to gallstone colic, and patients who had previously suffered from cholelithiasis had attacks during this epidemic.

W. H. Washburn³ records 6 cases of **infectious jaundice**, the first 2 coming on directly after typhoid fever; the third, after operation for the radical cure of hernia; the fourth, after miscarriage; the sixth appeared in a patient with membranous enteritis; while in the fifth there was no definite preceding disease. All were mild excepting the fifth case, which had severe nervous symptoms, and after once improving subsequently relapsed and died. Washburn believes that all forms of infectious jaundice should be classed under 1 head; and that infectious or malignant jaundice, Weil's disease, epidemic jaundice, and acute yellow atrophy of the liver should be considered various grades of the same disease so long as we have no more definite knowledge of their etiology.

Castaigne⁴ investigated the question of **alimentary glycosuria** in 20 cases of **icterus**. In 5 that had the clinical appearance of simple catarrhal icterus no glycosuria was produced. These cases recovered rapidly; but 11 others showed glycosuria up to the time of the occurrence

¹ Deutsch. med. Woch., June 8, 1899.

² Boston M. and S. Jour., Aug. 4, 1898.

³ Médecine, 1899.

⁴ Compt. rend. de la Soc. de Biol., Feb. 23, 1899.

of critical polyuria and azoturia. The glycosuria then disappeared and the patients recovered. There was persistence of the glycosuria in 4 cases, and in these the icterus was prolonged and accompanied by a number of relapses. He thinks that the persistence of alimentary glycosuria in these cases is of **bad prognosis**. Its absence or rapid disappearance makes the prognosis favorable.

W. Bain¹ discusses the **chronic congestion of the liver** which is unassociated with organic disease and shows no febrile disturbance, persisting usually for several weeks to several months, and commonly due to excessive indulgence in alcohol or rich foods, to sedentary habits, disturbance of digestion, gout, often to residence in the tropics, and sometimes connected with the climacteric. It causes irritability and general lassitude, headache, vertigo, and digestive disturbance, with a muddy color of the skin, and the liver becomes enlarged and somewhat tender. Bain believes that the amount of ammonia in the urine is but slightly increased in this condition; while in cirrhosis there is a marked increase, and that this is a distinguishing sign. The venous radicles of the abdomen are often distended, even with chronic congestion, so that this is not a sign of any value. The treatment should include exclusion of alcohol, careful diet, the proper amount of exercise, and cholagogue drugs.

Cirrhosis.—J. G. Adami² observed some years ago, in examinations of animals that had died of Pietou cattle-disease, that the liver and abdominal lymph-glands contained a **small microorganism**, which sometimes seemed to be a diplococcus and at other times was a distinct bacillus; the microorganism was found in the tissues also. This led him to study the bacteriology of progressive cirrhosis of the liver in man, since the Pietou cattle-disease shows cirrhosis of the liver as the chief lesion. In 26 cases of human cirrhosis, one form of microorganism was constantly present in the tissues. This was best stained with carbol-fuchsin, afterward bleaching with sunlight. Adami cannot state positively whether the human and bovine forms are identical. He details a case of atrophic cirrhosis of the liver that occurred in a woman of 56, who was an alcoholic. There was marked atrophy of the liver; while the lymph-glands of the abdomen, especially in the neighborhood of the portal fissure and about the pancreas, were much enlarged. Microscopic study of the liver showed diffuse cirrhosis, with infiltration by round cells, and the diplococcus that had been seen in the other cirrhotic livers was found. It was also present in the sediment that was obtained by centrifugating the fluid from the abdominal and pleural cavities, and in cover-glass preparations from the liver, blood, the left kidney, and the mesenteric glands. Cultures were not entirely satisfactory in Adami's studies, as a rule; but in this case the cultures yielded a microorganism similar to that found in animals dead of the Pietou disease. This was a diplococcus when grown in bouillon, and a bacillus of variable length when agar was used as the culture-medium. Further investigations³ led Adami to decide that this organism is a **form of the colon-bacillus**, and that it is practically always present in the liver even when there is no cirrhosis. In normal cases, however, they stain very imperfectly or not at all, and seem to be dead; while in cases

¹ Brit. Med. Jour., Oct. 1, 1898.

² Lancet, Aug. 13, 1898; Montreal Med. Jour., July, 1898.

³ Brit. Med. Jour., vol. ii., page 215, 1898.

of cirrhosis they in part stain well. He thinks, therefore, that in normal cases the liver kills the bacilli; while it is possible that when the liver-cells are less resistant, colon-bacilli may be able to produce cirrhosis of this organ.

V. Harley and W. Barrett¹ made an attempt to produce **cirrhosis of the liver in cats**. They opened the abdomen, turned the liver upward, in order to reach the left hepatic duct, and ligated this duct. The animals subsequently seemed entirely well; there was no jaundice, and the stools were of normal color. When the animals were killed 5 or 6 months later, the left lobe was found distinctly atrophied. There was decided increase of interlobular tissue, this being most marked in the animals that were allowed to live longest after the operation. The lobules seemed somewhat atrophied; the bloodvessels of the interlobular tissue were thickened to some degree, and the biliary passages dilated. There were no local areas of necrosis.

A. James² believes that cirrhosis of the liver is due to a failure of nutrition in that organ and a decrease in the metabolic activity of the cells. He also considers carcinoma a result of a transitional process that is constantly going on, and not of the production of cells of entirely new character. In carcinoma the development of the cells is believed to be stopped before the developmental process is complete; the liver is therefore thought to be undergoing a form of retrogression in both cirrhosis and carcinoma. This retrogression is believed to be due to some toxin. [Similar theories have been advanced for the etiology of cancer in general, but proofs are wanting.]

J. Marischler and E. Ozarkiewicz³ have made **studies of the metabolism** of nitrogen, chlorids, phosphates, and calcium in 3 cases of cirrhosis of the liver with ascites, comparing the conditions when the fluid was increasing, when it was decreasing, and after its removal by aspiration. They draw especial attention to the fact that **phosphorus was lost** in these 3 cases under all conditions, in spite of the varying age of the individuals examined, and even when there was at times a reduction of N, Cl, and Ca. Such a loss of phosphates, without loss of either nitrogen, calcium, or chlorids, seems, from the reports extant, to be peculiar to cirrhosis of the liver. In their cases, while the fluid was collecting there was a retention of N, Ca, and Cl. This they attribute partly to the amount retained in the ascitic fluid; but this would not explain the condition entirely, since examination of the fluid removed by aspiration showed that it did not by any means contain the whole amount retained. The remaining retention was attributed to subnormal metabolic activity. When the fluid was being absorbed there was a decided increase in excretion, first affecting the chlorids, and then the phosphates; and a striking increase, lasting for about 2 days, occurred after removal of the fluid by aspiration. This latter increase was attributed to the improved condition of the circulation. [This is the same explanation offered long ago by Oertel in his cases of obesity with loss of cardiac compensation, in which marked reduction of fat occurred after reducing the water ingested. This fat-reduction was attributed partly to increased oxidation brought about by the improved condition of the circulation.] The

¹ Brit. Med. Jour., Dec. 10, 1898.

² Scottish M. and S. Jour., July, 1898.

³ Arch. f. Verdauungs-Krankh., Band 5, Heft 2.

absorption in these cases during the presence of ascites was poor, 12% of the nitrogen of the food being recovered in the stools. The intestinal secretion was believed to be poor at the same time, since the excretion of calcium through the bowel was low, and this increased after reduction of the fluid. With reduction of the fluid and increased calcium-excretion the nitrogen in the stools decreased: and these conditions were believed to indicate both better absorption and better secretion.

E. Stein¹ records a case of cirrhosis of the liver in which the **chief symptom** throughout the course of the disease was **repeated hemorrhage** from the bowel, and this finally caused death. There were no symptoms of ulcer of the duodenum; and he considers the diagnosis well established. Three other cases from the records of Fleiner's clinic are given, and Stein then gives a general study of hemorrhage from the gastrointestinal tract with cirrhosis of the liver.

Dreyfus² describes 2 cases which showed **hemorrhage from the upper air-passages** in association with cirrhosis of the liver. In both cases there was disease of the upper air-passages also, and it is thought that these hemorrhages occurring in cirrhosis of the liver are usually not due to mere passive congestion of the mucous membrane, but are perhaps often the result of local disease of the vessels or of a hemorrhagic diathesis caused by the liver itself.

Reichel³ reports the case of a man of 35, who had been a pronounced alcoholic, and who presented symptoms of cirrhosis of the liver, with great ascites and general edema. Repeated tapping and mercurial inunctions resulted in seemingly entire recovery. The author thought that this was not a case of luetic cirrhosis, since all signs of syphilis were absent, and decides that it was an instance of **cure of a Laennec's cirrhosis**.

N. Kirikow⁴ records a case of **hypertrophic cirrhosis** of the liver which ran an **unusual course** and ended with evidences of general infection of the organism. A man, 37 years of age, had been greatly exposed to dampness in his work and in his dwelling, had always eaten excessively rapidly, and his food had been very poor; there was no history of alcoholism or syphilis. The symptoms began with marked loss of weight; then an attack of violent pain over the liver. Soon after, he developed a severe quotidian malaria; after this, gastrointestinal disturbance appeared, and violent vomiting developed later on; at one time blood was passed from the bowel. The liver and spleen were much enlarged; the stomach-contents contained no HCl; he was anemic, and the anemia progressively increased. Leukocytes were present in excessive number. Ascites appeared and became very extensive. A short time before death he had severe diarrhea, and became sleepless, delirious, and finally comatose; the temperature was at first normal, but rose again, and preceding death he had slight, irregular fever. The liver during this time decreased rapidly in size, and became so small that it could not be felt. Postmortem, this organ was found hard and heavier than normal; it presented increase of connective tissue about the acini and within them, and proliferation of the bile-canals, with some areas of necrosis of the liver-substance. There was no periangiocholangitis. During the latter part of

¹ Arch. f. Verdauungs-Krankh., Band 5, Heft 1. ² Münch. med. Woch., Aug. 9, 1898.

³ Wien. med. Woch., No. 1, p. 24, 1899.

⁴ Zeit. f. klin. Med., Band 36, Hefte 5 u. 6.

the man's illness microorganisms, which seemed to be a variety of protozoa, were found in the blood, and these were present in the liver-tissue. Kirikow believes that the hypertrophy in this form of cirrhosis is largely due to hyperemia; he also insists that this form of cirrhosis was not identical with the so-called biliary cirrhosis, since there was no evidence of periangiocolitis. The enlargement of the spleen, in his view, must be attributed to chronic splenitis, and not to obstruction of the blood-current. He believes that the condition is a general infectious disease, and that the terminal symptoms are probably often due to general infection of the organism. He notes its resemblance in the last stages to Weil's disease, and states that Hayem is in error in teaching that hyperacidity and hyperpepsia are always present in this disease. The acid and pepsin vary according to the condition of the patient, and both may be absent, particularly in the later stages; also, hyperleukocytosis is not always present; there may be even a hypoleukocytosis.

Hasenclever¹ records the occurrence of hypertrophic cirrhosis of the liver, with chronic icterus and enlargement of the spleen, in **3 children of the same family**. The patients were 24, 22, and 18 years of age, and belonged to a family in which there had been 10 children, 3 of whom died in early life. The mother had also miscarried once. The father had had apoplexy at 32 years of age, and 1 of the patients had had persistent and severe inflammation of the eyes in childhood. Besides this, all the patients showed imperfect physical development, so that it is probable that congenital syphilis was the cause of this familial cirrhosis of the liver, though the dwelling in which the family lived was very damp, and perhaps this exposure had been active in producing the disease. The cirrhosis was of the type described by Hanot. It had persisted 4 years; the liver had become much enlarged; the icterus was constant and severe; the spleen swelled early and became greatly enlarged; there was no ascites; the disease advanced with exacerbations. There were no symptoms of gallstones nor of tumors pressing upon the ducts. One patient died after 5 years, from severe gastrointestinal hemorrhage; at the necropsy the liver was found greatly enlarged, its surface somewhat uneven, and the connective tissue much increased, particularly in focal areas. This increase was mostly in the form of fine fibers, though in certain areas there was much infiltration with round cells. The change was chiefly interlobular, though at times the new-formed tissue extended into the acini and about the cells. There was no distinct proliferation of the bile-ducts.

J. Sabrazès and O. Dion² treated ascites with urea, using it as a diuretic in 4 cases of ascites. Pronounced effects were not observed excepting in 1 case. In 1 other case there was slight improvement; while the remaining 2 were not benefited at all. They decide that urea is effective only in benign forms of atrophic cirrhosis; and that when any oliguria present does not yield to ordinary diuretics, urea will probably be of no value. They state that any diuretic effect of urea is produced by increasing blood-tension, and thus causing greater renal activity.

Maignot³ has treated the ascites resulting from both tuberculous peritonitis and cirrhosis of the liver by the **injection of 1 to 2 liters of**

¹ Berlin. klin. Woch., Nov. 7, 1898.

² Rev. de Méd., Sept. 10, 1898.

³ Thèse de Lyon, 1898.

oxygen. With this amount but slight pain ensued, and the author believes that remarkable results were obtained.

D. R. Brower¹ discusses the value of **gold and sodium chlorid.** This drug he finds particularly useful in all conditions associated with sclerosis, as in cirrhosis of the liver, interstitial nephritis, arteriosclerosis, and sclerosis of the central nervous system. He finds it valuable also in syphilis when specific treatment is not well borne; and in diabetes mellitus, tuberculosis, and functional nervous diseases he has had good results from its use.

Dieulafoy² reports 2 cases of **abscess of the liver** following appendicitis. One, in a man of 34, was associated with jaundice, high temperature, and marked prostration, the liver enlarging very greatly. The patient stated that he had had an attack resembling appendicitis, but of very mild character, 10 days before the onset of his hepatic symptoms. His condition grew worse, and was accompanied by chills and fever of varying severity. The liver enlarged to an enormous degree: there was pain over this organ. Facial erysipelas appeared, and the patient died 28 days after admission. The postmortem disclosed great numbers of small abscesses in the liver; the appendix was found surrounded by adhesions, and beneath it was a small abscess which contained fetid pus, from which a pure culture of the colon-bacillus was obtained. He directs attention to the great rapidity of the course of these cases, and to the almost necessarily fatal character of the disease. The only way in which it can be met is through prophylaxis—namely, early operation when any signs of appendicial abscess exist.

D. G. Marshall³ reports a case of **tropical abscess** of the liver in a man who had first been in Africa and acquired dysentery. He had liver-abscesses after his return, was operated upon and recovered. He then went to Ceylon, had another attack of dysentery, another abscess was opened, and 3 weeks later he had a sudden attack of dyspnea and died. A thrombosis was found in a large vein at its junction with the inferior cava, and in the thrombus were numerous amebæ and fragments of degenerated liver-cells. The case illustrates the danger to such patients in returning to a climate in which tropical dysentery occurs frequently.

W. Bain,⁴ in determining the **nitrogenous excretion** in a case of liver-abscess from which 48 oz. of pus were removed, and which resulted in death, discovered that the excretion was practically normal, considering the small amount of food taken in the diet, in spite of such great destruction of the liver-tissue.

H. Schmaltz and O. Weber⁵ record a case of **chronic hyperplastic perihepatitis** (Zuckergassleber). The patient was a woman, 42 years of age, who was free from specific history or other incidents of importance. The disease was said to have begun after catching cold, and was accompanied by profound anemia, dropsy of the legs, and ascites, the liver increasing considerably in size. Two years later she had much pain over the liver, the organ was much enlarged, the ascites was marked, and the legs much swollen. The spleen was not definitely determined to be enlarged. The hemoglobin was reduced to 10%; the red blood-cells to

¹ Jour. Am. Med. Assoc., Oct. 24, 1898.

³ Brit. Med. Jour., June 10, 1899.

² Sem. méd., Nov. 9, 1898.

⁴ Lancet, Apr. 29, 1899.

⁵ Deutsch. med. Woch., Mar. 23, 1899.

1,187,000. The urine was normal, excepting for the presence of a slight amount of albumin; there was no jaundice, and no bile in the urine. Repeated aspirations were undertaken, the patient's health failed rapidly, and death occurred from exhaustion. The severe pain about the liver, with enlargement of this organ, and the absence of evidence of circulatory disease and of signs of stagnation in the portal system, had led the authors to suspect the existence of a chronic hyperplastic perihepatitis. The liver over the left lobe and part of the right lobe was found very adherent; while over the remainder of the organ there was a thick, porcelain-like, shining exudate from 5 to 6 mm. in thickness. Pick has suggested that this disease is a pseudocirrhosis of the liver, the disease being the result of chronic pericarditis and consequent circulatory stagnation. In this case, however, there was neither adherent pericardium nor any other serious disease of the heart. The authors suggest that the enlargement of the liver is primary, and this leads to lessened resistance on the part of the peritoneum covering this organ; thus, infection of a low grade takes place locally in the peritoneum; in this case the affection might have come from a chronic appendicitis. The ascites they attribute largely to the loss of the absorptive function of a large portion of the peritoneum; and they note that in this region normally a large amount of fluid is absorbed from the cavity, and that thickening here would lead to an especially large accumulation of fluid. The diagnosis, they consider, should be largely based upon the acute onset of the disease, with slow but uncontrollable progress, unassociated with evidence of stagnation in any part of the digestive canal.

Tumors of the Liver.—A. Engelhardt¹ reports a case of **multiple adenoma** of the liver, with cirrhosis, in which the tumors projected into the portal vein and caused complete thrombosis of even the small branches. He has inquired into the relation between **cirrhosis and adenoma**, since these 2 conditions are so commonly combined, and reaches the conclusion that the one is not dependent upon the other, but that both are dependent upon the same cause, which seems to be an irritant intoxicant. This view is based chiefly upon the fact that the chronic interstitial change which produces cirrhosis is not noteworthy at the beginning of the appearance of the tumors. Therefore a cirrhosis does not seem to be the cause of the tumors, nor do they seem to produce interstitial change in their immediate neighborhood before it occurs elsewhere. The thromboses that have been repeatedly observed seem to be due to a tendency of the growths to involve the bloodvessels, and this is emphatic evidence of their tendency to malignancy. Multiple adenomas are most likely to arise after middle life, and most commonly affect the male sex. The symptoms to which they give rise resemble those of Laennec's cirrhosis, largely as a result of the compression of the vessels and bile-passages. The diagnosis between adenoma, Laennec's cirrhosis, and primary carcinoma of the liver is difficult to an extreme, and there are usually no absolutely distinguishing symptoms between adenoma and carcinoma. An interesting observation is that in the case reported the extremely cirrhotic liver seemed to secrete large amounts of bile, in spite of the fact that the portal vein was completely thrombosed even in the small branches. The origin of the bile

¹ Deutsch. Arch. f. klin. Med., Band 60, Heft 6.

is believed to have been the adenomatous tumor-masses, since there was scarcely any other liver-tissue to have given rise to it. In the same article Engellhardt records 2 cases of **solitary adenoma** of the liver, these masses forming small, well-circumscribed tumors, that proved upon microscopic examination to be composed of liver-cells. Such cases are rare, and the few others reported show that they always occur as well-circumscribed tumors having a connective-tissue capsule, out of which they may be easily peeled. The cells composing them are seen to be either normal or altered liver-cells, arranged much as the cells are in the normal liver. The surrounding tissue of the liver is usually entirely normal, but in 1 of the cases on record cirrhosis had appeared. Engellhardt believes that the tumors are congenital; and besides the evidence that others have advanced for this view, he notes that in 1 of his cases there were other abnormalities of the liver which were evidently congenital. [Notwithstanding the author's view, we are of the opinion that cirrhosis may be a potent factor in the etiology of multiple adenomas, as cirrhotic processes in the breast appear to be active in a similar way.]

R. Witwicky¹ gives the notes of a case in which an adenoma of the liver was mistaken for a carcinoma. The patient was a man, 49 years old, who had severe epigastric pain, jaundice, putty-colored stools, and an enlarged and tender liver, which presented smooth nodules over its surface. The disease ended in death, and at the postmortem there were found **numerous small tumors** surrounded by capsules. Microscopic examination showed interesting features: There was general cirrhosis of the liver; in the next stage of the disease there were small islands of hyperplasia; and in the next stage these hyperplasias formed nodules, which were not encapsulated; in the last stage there were small nodules surrounded by capsules. The cells contained within them had the appearance of liver-cells; they were arranged in radiating columns somewhat resembling tubular glands; vessels were few and ill-formed. Witwicky believes that the whole process was a gradual change from hyperplasia of insular form into adenomas; the capsule being formed to replace the tissue-loss resulting from some atrophy of the liver-tissue about the adenoma. He divides adenomas of the liver into 3 classes. The first is due to simple proliferation of the liver-cells, which produces encapsulated nodules which do not give metastasis and do not develop into cancer. Those of the second form are composed of cylindrical cells, and develop from the bile-canals; these often give metastasis, and are likely to develop into cancer. The third variety is a combination of the 2 preceding.

L. Hektoen and J. B. Herrick² report 3 cases of diffuse infiltration of the liver with **secondary melanotic sarcoma**. In all of the cases ascites was present. There was no postmortem in the third case; but in the 2 other cases microscopic examination showed widespread capillary embolism of tumor-cells, the emboli seeming to have come through the hepatic artery. These emboli produce obstruction of the portal circulation and sometimes thrombosis of the small radicles of the portal vein, as in 1 of the cases here reported, the result being the development of ascites. In the third case it was believed that the ascites was caused by the development of a new growth of the peritoneum. In some cases, of course, the ascites might be due to a coexistent cirrhosis of the liver or

¹ Zeit. f. klin. Med., Band 36, Hefte 5 u. 6. ² Am. Jour. Med. Sci., Sept., 1898.

kidney-disease. In the diagnosis of sarcoma of the liver and of ascites due to this cause the authors direct attention to the necessity for minute inquiry into the nature of any possible eye-trouble, or the reason for the necessity for removing an eye that is seen to have been lost, since the most frequent primary seat of the growth is in the eye. They also insist that small nodules frequently develop in the skin and subcutaneous tissues, and are likely to be overlooked, even by the patient, unless a careful search is undertaken. The nature of an exudate into serous cavities that is suspected to be the result of malignant disease may sometimes be determined by taking the specific gravity of the fluid and by studying the cells contained in it.

Echinococcus.—Bonet and Chazovlière¹ obtained a **crystallizable ptomain**, which was very toxic, from the fluid they removed from a hydatid cyst of the liver. They believe that so long as the vitality of the cyst is undisturbed the fluid is not toxic; but if degeneration takes place, toxic materials are produced. It is particularly likely to follow puncture, electrolysis, and similar interference. In this case the fluid when first removed was scarcely at all toxic; but it reaccumulated, and electrolysis was done; the fluid was again removed by puncture 10 days later; this latter fluid contained the ptomain. Recovery from this local affection took place; but the man subsequently died of pulmonary tuberculosis.

DISEASES OF THE BILIARY PASSAGES.

E. M. Brockbank² has studied the importance of **diseases of the heart**, especially mitral stenosis, in the **causation of gallstone**. In over 13,000 complete postmortem records he found that gallstone had been present in 4% of the males, 15% of the females, and in all subjects in 7.4%. In mitral stenosis the percentage was 21.8; with cardiac enlargement secondary to nephritis, 5.6%; in hypertrophy secondary to marked endocarditis, 10%; in hypertrophy secondary to alcoholism, 7.1%. In the total sum, 10.9% of all cases of cardiac disease had gallstone; while but 5.4% of individuals free from disease of the heart showed them. This is, he believes, due to depression of general vitality and to the constant passive congestion of the mucous membrane of the gallbladder and biliary passages.

Chauffard³ records a case of hepatic colic in which **sudden death** occurred immediately after an attack of violent pain. The autopsy showed a healthy heart, and no definite disease, excepting a gallstone in the cystic duct. The patient had been addicted to alcohol, she had icterus, and had had repeated severe epistaxis and metrorrhagia. Chauffard believes that death was due to intoxication rather than to reflex syncope.

W. H. White⁴ records a case of gallstone in the common duct resulting in **infective cholangitis**. The woman had had repeated attacks of gallstone-colic, followed by sweats, fever, and chills. The stools were alcoholic; the liver much enlarged and tender. Treatment caused the passage of 3 small gallstones, after which the fever disappeared and the other symptoms improved. There was a recurrence, however, and for 3 weeks irregular chills and fever were noted, after which 3 more gallstones

¹ Rev. de Méd., Nov., 1898.

³ Gaz. des Hôpitaux.

² Edinb. Med. Jour., July, 1898.

⁴ Lancet, Dec. 6, 1898.

were passed; although there were repeated recurrences, the patient finally recovered. Antistreptococcic serum was used in the case without any effect.

Willoughby¹ describes a case in which there were attacks that had been diagnosed as due to gallstone; but it was decided that they resulted from inspissation of the bile, and **toluylendiamin** was administered as a cholagog, giving first 1, subsequently 2, gr. daily. After 3 years of illness, the woman became entirely well within 2 months.

P. J. Möbins,² who has for years been a subject of severe attacks of abdominal pain which had been diagnosed gallstones, found that a form of **massage of the liver** is the most satisfactory treatment for the prevention of the attacks. This massage is carried out by inspiring deeply, holding the breath for a short period, and then expiring slowly. He believes that many cases of gallstones—and perhaps other diseases of the liver—are dependent upon insufficient movement of the diaphragm. Diaphragmatic breathing normally tends to favor the flow of the bile; and if it is insufficient, the bile tends to stagnate; with any cause of infection, favorable conditions for the formations of gallstones are present.

H. Kehr,³ after much experience in the **operative treatment** of cholelithiasis and the occurrence of the disease in his own person, discusses the question of the Carlsbad treatment of the disease and its surgical treatment. He decides that internal treatment, especially by the Carlsbad cure, should be recommended for (1) obstruction of the common duct, unless the condition has become chronic, fever has appeared, the pulse grown rapid, and there is evidence of cholangitis; (2) in cases of inflammatory processes of the gallbladder, if these are of rare occurrence and not very severe; (3) in attacks of frequent colic when gallstones are passed with each attack; (4) in those who have serious disease of the heart, lungs, kidney, or liver, or who are the subjects of obesity, severe gout, or diabetes; (5) in persons who have already been operated upon. He would operate (1) in acute seropurulent cholecystitis and pericholecystitis; (2) when adhesions have formed and cause symptoms; (3) when there is chronic obstruction of the common duct or the same condition in the cystic duct; (4) in all cases that begin mildly and, in spite of treatment, grow progressively worse; (5) in purulent cholangitis and abscess of the liver; (6) when perforation has resulted; and (7) in those cases in which morphinism has resulted from the gallstone attacks. If an accurate diagnosis cannot be made, and frequent attacks of pain occur, he advises exploratory incision.

DISEASES OF THE PANCREAS.

A. Katz and F. Winkler⁴ have made experimental investigations into the **causation of fat-necrosis** with pancreatic disease. They tied and then divided the ducts of the pancreas all the way around the gland, being careful not to injure the vessels. This procedure was carried out upon 51 dogs. From this extensive series of experiments, they report that they found marked fat-necrosis. Hemorrhage was almost always

¹ Therapist, Mar. 15, 1899.

² Münch. med. Woch., Mar. 7, 1899.

³ Ibid., Sept. 20, 1898.

⁴ Arch. f. Verdauungs-Krankh., Band 4, Heft 3.

present about the necrotic areas, and the necrosis was most marked in the immediate neighborhood of the ligatures, so that it seems apparent that it was the result of the action of the fat-splitting ferment of the pancreas, which would of necessity have its most marked effect in regions most subjected to its action. It was also evident that the hemorrhages increased the tendency to necrosis, probably by reducing the vitality of the tissues. A marked leucocytosis occurred during the life of the animals, and this the authors attribute to the breaking down of the cells (which was evident upon the histologic examination) and the action of the nuclein from the cell-nuclei, since control-experiments showed that the leucocytosis was not the result of either narcosis or the simple opening of the abdomen. In practically all the dogs they found the spleen atrophic; and this leads them to the conclusion that the spleen and the pancreas show a correlation in their pathologic processes. This is rendered more probable by the fact that these 2 organs have a similar developmental origin, and by the further fact that it is somewhat probable, from previous experimental work, that the spleen provides a ferment which assists the action of the pancreatic ferment.

Ferrand¹ describes a case of **hemorrhagic pancreatitis** due to traumatism. The man received a violent blow in the epigastrium in April; though he had at no time any acute febrile attack, he had pain of varying intensity radiating throughout the abdomen, constipation, and loss of appetite until October, when death occurred. The autopsy showed a large amount of hemorrhagic fluid in the peritoneal cavity, while the abdominal organs were all normal, excepting the pancreas, which was dark in color, swollen, and microscopically was found to be infiltrated with blood and showed marked sclerosis of the connective tissue.

M. Manges² reports a case of acute pancreatitis in which **laparotomy** was done, and disclosed disseminated fat-necrosis of the omentum and peritoneum. The general condition improved after this exploratory operation, and the patient **gradually recovered**.

J. C. Hemmeter, H. Adler, and M. Tiffany³ describe a case of **pancreatic cyst**, and give a report of the study of the fluid removed. The illness began with sudden cramps in the epigastric region, followed by vomiting, which was incessant for about 5 days. There was a tumor in the epigastric region slightly to the left, which did not move with respiration and was cystic. Operation removed nearly 1 liter of fluid; and some days afterward a slough which contained a portion of the pancreas was removed. The fluid was chocolate-colored, neutral, and of a specific gravity of 1028. It contained bile-acids, albumin, globulin, propeptone, and blood-pigment, but no sugar, peptone, or xanthin-bodies. The sediment contained epithelial cells, largely degenerated, hematoidin-crystals, cholesterin-crystals, hyaline translucent bodies, and a granular detritus. Hemmeter believes that the rapid emaciation which usually occurs in these cases is due to the imperfect digestion of the foods, resulting from lack of the pancreatic secretion.

J. Lenarcic⁴ reports his examination of fluid obtained by the puncture of a pancreatic cyst. This fluid was brownish red, and contained but little sediment, in which there were some red and white corpuscles,

¹ Sem. méd., Nov. 23, 1898.

² Phila. Med. Jour., Apr. 1, 1899.

³ Med. Rec., Aug. 6, 1898.

⁴ Centralbl. f. innere Med., July 30, 1898.

chiefly the former. There were no compound granule-cells. The specific gravity was 1010, and the fluid was slightly alkaline; it contained sugar, a little mucin, and, as shown by the spectroscope, oxyhemoglobin. There was also another derivative of blood-pigment, the nature of which was not determined. Peptone, tryptophan, and urea were absent. The fluid digested starches, but had no action upon proteids; it resembled closely the pancreatic juice obtained from a dog by means of a fistula.

Zoja¹ insists that **saponaceous and fatty stools** are entirely different in character and clinical significance. Saponaceous stools, commonly called acholic, contain insoluble soaps and fatty acids, and indicate deficient absorption or the absence of bile from the intestine; while fatty stools contain fat-droplets, which may be recognized by the microscope, and they are indicative of absence of the pancreatic juice.

A. E. Taylor² reports the case of a man who presented cachexia with progressively increasing icterus, in which the diagnosis of a tumor obstructing the bile-duct had been made. Taylor found that the **ethereal sulphates** in the urine were **much decreased**, and this led to the suspicion that there was also closure of the pancreatic duct, since he believed that it was probable that, in the absence of pancreatic secretion, the proteids would not be sufficiently digested to allow their further reduction by the bacteria and the production of ethereal sulphates. He suggests that the ethereal sulphates should be studied in cases of possible closure of the pancreatic duct, as a similar reduction may be found, and may prove to be a valuable diagnostic sign.

W. P. Northrup and C. A. Herter³ investigated the **fat-absorption** in a case of **carcinoma of the pancreas**, in which the pancreatic duct was believed to be entirely obstructed. The amount of fat excreted in the feces was excessively large; the fat-splitting process was carried out to practically a normal degree, however; and this is explained by attributing the splitting of the fat in this case to the action of the bacteria of the intestine. It is an interesting point that in this case, in spite of the probable absence of the pancreatic juice from the intestine, there seemed to be excess of proteid-decomposition, as was shown by the strong indican-reaction in the urine.

W. Elstein⁴ describes the case of a woman of 36, who had had dyspeptic symptoms, but improved after using the abdominal bandage. She had subsequent digestive disturbance, however, with severe constipation; pleurisy developed on the left side, with violent dyspnea, and death soon occurred. The disease was found to be **primary carcinoma** of the pancreas, with widespread metastasis, the pleurisy being due to this. There was, however, a large hemorrhage in the abdominal cavity, which came from the spleen.

S. B. Ward⁵ reports the case of a man, 54 years of age, who had had dyspeptic symptoms, but no definite signs. Carcinoma had been suspected, but it had been impossible to elicit definite evidence of it. Post-mortem examination revealed a **primary colloid cancer** of the tail of the pancreas, with widespread metastasis to the organs in the abdominal cavity and to the lung.

¹ Clin. Med. Italiana, p. 589, 1898.

² Proc. Path. Soc. of Phila., Mar. 1, 1899.

³ Am. Jour. Med. Sci., Feb., 1899.

⁴ Deutsch. med. Woch., Feb. 2, 1899.

⁵ Albany Med. Ann., Jan., 1899.

Mayer¹ demonstrated a case of carcinoma of the pancreas in which there had been **fatty stools** and a silver-gray **discoloration of the skin**.

DISORDERS OF THE URINE AND KIDNEYS.

C. W. Purdy² believes that the following is an accurate method for the **rapid determination** of the **amount of albumin** in the urine. The albumin is precipitated in graduated tubes by adding to 10 cc. of urine 2 cc. of a 50 % acetic-acid and 3 cc. of a 10 % potassium-ferrocyanate solution. After standing 10 minutes, the mixture is centrifugated in an instrument with a radius of exactly $6\frac{3}{4}$ in., revolving at the rate of 1500 revolutions per minute; this being continued for exactly 3 minutes. The volumetric percentage is then read from the scale. The error by this method was found to be not more than 0.01 %.

A. Christomanos³ reminds one that **picric acid** will give a heavy, yellow precipitate with urines containing quinin, and that in using the Eslach reagent such a precipitate might readily be mistaken for albumin. Albumin may, however, be considered absent if other tests than the picric-acid solution give negative results. And if such tests are negative and the picric-acid test is positive, Christomanos states that one may, with considerable certainty, say that quinin is present in the urine; and the same conclusion may be reached if picric acid gives a heavy precipitate, while other albumin-reagents cause but slight cloudiness of the urine. In case albumin is present in considerable amount, this test for quinin is valueless, as boiling, in order to precipitate the albumin, will at the same time carry down the quinin.

J. M. Garratt⁴ discusses various **reagents for the detection of albumin** in urine. For the detection of a very slight albuminuria he recommends nitric acid, Roberts's solution, Millard's formula, potassium ferrocyanid, and heat. The reagents are used either by means of the contact-test or by diffusion. In order to carry out the contact-test more satisfactorily, Garratt has devised an instrument which consists of a U-shaped tube, the curved portion having a diameter of about $\frac{1}{16}$ in., the sides being much larger. One side is filled with urine as far as the capillary loop, and a finger held over the top; some of the reagent is then put in the other side, and the two liquids are allowed gradually to reach the same level, and thus a good contact is provided. The efficiency of the various reagents seemed in his investigations to be as follows: Millard's gave a reaction in 48 of 50 cases; Roberts's, in 43 of the same cases; potassium ferrocyanid, in 36 cases; nitric acid, in 30 cases; and the heat-test, in only 26.

W. Colquhoun⁵ recommends **carbolic acid** in solution in absolute alcohol as a **test for albumin** in the urine. The urine should be diluted, if concentrated, until the specific gravity is about 1010. The contact-test is then used, pouring the carbolic-acid solution upon the top of the urine. It is said to be extremely delicate.

P. J. Cammidge,⁶ after an extensive study of all the clinical tests for albumin in the urine, is convinced that the most convenient and the

¹ Wien. med. Woch.

³ Berlin. klin. Woch., Oct. 31, 1898.

⁵ Lancet, May 6, 1899.

² N. Y. Med. Jour., June 17, 1899.

⁴ N. Y. Med. Jour., July 16, 1898.

⁶ Ibid., Apr. 22, 1899.

least objectionable is **salicylsulphonic acid**. To exclude nucleoproteids, this test should be checked by Heller's.

W. M. L. Coplin¹ reports 2 cases, 1 of typhoid and 1 of tonsillitis, in which an **albumin soluble in acetic acid** was found in the urine. He emphasizes the fact that acetic acid or any other single test for albumin is unsatisfactory.

Combemale and Desoil² report the presence in the urine of 3 patients with eclampsia and 1 with Bright's disease of an albumin soluble in acetic acid. They consider that boiling urine with acetic acid is an uncertain test for albumin, and that **trichloracetic acid** should be used instead.

Benjamin³ finds by comparative estimations of known solutions of copper sulphate and of sugar, by both gravimetric methods and by **Lehmann's method of estimating sugar**, that the latter is valuable for clinical purposes and gives accurate results. It is carried out by mixing known quantities of Fehling's solution and of urine, boiling and filtering, and adding to the accurately measured portion of the diluted filtrate some sulphuric acid and afterward potassium iodid. This sets iodine free if sugar is present; and the amount of free iodine is determined by titrating with a $\frac{1}{10}$ normal solution of sodium hyposulphite until the brown color disappears.

R. T. Williamson⁴ describes his modification of the **phenylhydrazin test** for sugar. He fills a test-tube to about $\frac{1}{2}$ in. with powdered phenylhydrazin hydrochlorate; the same amount of potassium acetate is added; the tube half-filled with urine, and heated until it boils. After boiling for 2 minutes, it is placed aside for an hour, and subsequently examined for the crystals.

H. Stern,⁵ after describing the methods for determining the **acidity or alkalinity of the urine**, and noting the degree of normal acidity, describes his results from the study of the effect of certain drugs upon the acidity of the urine. He found that lithium citrate caused an increase in the amount of urine and a decrease in the acidity, but the amount of uric acid was not greatly changed. Uricidin had a most striking effect, the urine becoming distinctly alkaline, and uric acid being excreted in very large quantities. Stern's results with this drug in cases of latent gout have been very satisfactory. Piperazin and lysidin had little effect.

A. Krokiewicz⁶ contributes an important paper upon the **diazoreaction of Ehrlich**, based upon over 16,000 tests made in more than 1100 cases. He decides that the reaction always appears in typhoid fever within the first or second week, even in very mild or abortive forms. In favorable cases it disappears later, and its persistence may be considered an indication that the disease is not yet over; if it reappears during convalescence, it nearly always indicates a relapse. It is absent in carcinoma of the digestive tract; and in a doubtful **diagnosis between carcinoma and tuberculosis** of the digestive tract its absence is in favor of carcinoma; the contrary also is true. It is found sometimes in cases of ovarian cancer with metastasis to the peritoneum. It occurs in pulmonary tuberculosis and is then of bad omen. It is not

¹ Phila. Med. Jour., Apr. 29, 1899.

³ Deutsch. med. Woch., Aug. 25, 1898.

⁵ Med. Rec., Oct. 29, 1898.

² Arch. provin. de méd., No. 2, 1899.

⁴ Practitioner, Dec., 1898.

⁶ Wien. klin. Woch., July 21, 1898.

commonly found in other forms of tuberculosis, except the acute miliary variety. Diseases of the kidney do not produce it unless they are associated with intoxication of the system with chromatophorous substances. It is therefore of distinct diagnostic, and especially prognostic, importance in tuberculosis and typhoid fever. In most other diseases it is of no clinical value in either prognosis or diagnosis.

J. B. Barber¹ reports his results from 1975 tests of the **diazo-reaction** in 452 patients. He states that its occurrence in acute disease should arouse the suspicion of typhoid fever, and its absence upon daily examination up to the fourteenth day is valuable evidence of the absence of typhoid. Of his 234 cases of typhoid, 218 gave positive reactions, while in 16 it was absent. It is notable that 14 of 19 cases of tuberculosis gave it, 12 of 13 cases of measles, 10 of 11 cases of scarlet fever, and 11 of 31 cases of pneumonia. It was found present in several other diseases. In general, he found that it was much **less reliable in children**, as a test of typhoid, than in adults, since the reaction is very likely to be positive with numerous other diseases in children.

Disorders of the Urine.—J. Cohn² records a series of cases, instancing the occurrence of **family cystinuria**. The case first observed occurred in a girl, 7½ years of age, who had signs of stone in the bladder, and from whose bladder a stone about the size of a walnut, and composed almost entirely of cystin, was removed. Her family consisted of 12 members, of whom 2 could not be examined; 3 while under observation never had cystin in the urine; 2 showed its presence in large quantities and constantly, while in all the others it was discovered at repeated intervals. There were, therefore, 7 instances of cystinuria in the family—a further evidence of the origin of this anomaly in disturbance of metabolism. An attempt to demonstrate the presence of diamins in the urine of the case first mentioned was negative.

V. Hirschlaff³ records the case of a man of 70, who had symptoms of nephrolithiasis, with the formation of a tumor in the region of the kidney. He had repeatedly passed dark, brownish-red, alkaline urine, and aspiration of the tumor yielded a similar fluid. Both fluids showed on the surface a mass of brilliant scales, which the microscope proved to be **cholesterin**. Chemic methods showed that 5.8 gm. of this substance were present in 100 cc. of urine.

H. T. Bewley⁴ describes a case of **chyluria** which occurred in a woman of 40, who had lived in Mauritius and Hong Kong years before, but, so far as could be determined, was not a subject of filarial disease. Her symptoms were chiefly severe pain in the back and a sensation as if a child's head were passing the perineum when she urinated; large clots of milky color were passed with severe pain. There was marked swelling of the legs, and the urine contained a large amount of fat-emulsion. Treatment by rest and tonics caused her to regain practically entire health.

R. D. Hotchkiss⁵ records a case of **hematoporphyrinuria** which resulted fatally, due to the use of sulfonal. The disturbance began with gastric symptoms, which were followed by profound nervous symptoms

¹ Northwestern Lancet, Aug. 1, 1898.

² Berlin. klin. Woch., June 5, 1899.

³ Deutsch. Arch. f. klin. Med., Band 62, Hefte 5 u. 6.

⁴ Dublin Jour. Med. Sci., Jan., 1899.

⁵ Brit. Med. Jour., Sept. 10, 1898.

ending in paresis. Hematoporphyrin was found in the urine. The liver was fatty and the kidneys sclerosed; and because of the latter lesion, Hotchkiss recommends that sulfonal should not be used until it is determined that the kidneys are healthy.

T. Fessler¹ records 2 cases of **paroxysmal hemoglobinuria**. Both patients had passed dark-colored urine repeatedly. In the first this had occurred 5 times within 2 years, and always after drinking cold beer. The patient was a man of 65. The second case was a middle-aged man, in whom the hemoglobinuria followed exposure to cold. It had first appeared after an exhausting march. This man had a small mass in 1 inguinal region, and mercurial treatment was adopted, with the result that the affection seemed entirely overcome, though the patient denied any specific history. Neumann² records the case of a syphilitic patient who showed paroxysmal hemoglobinuria whenever exposed to cold.

David Newman³ discusses **hematuria and its diagnosis**, and presents 19 illustrative cases. The source of the hemorrhage is often determined by studying the character of the urine, or of the blood-clot if such is present. The further down the source of the hemorrhage, as a rule, the less is the alteration in the appearance of the blood; though this is not true when the hemorrhage has been from the bladder in cases in which there is residual urine, as the color is rapidly changed in such instances. Occasionally the clot encloses some of the tissue from the source of the hemorrhage, and then microscopic examination makes practically an absolute diagnosis. If clots are large, they cannot have come from high up, near the kidneys. The study of the morphologic elements in the urine is often helpful. Renal hematuria is apt to appear very suddenly, and disappear quite as suddenly. In cases of stone in any location, rest causes improvement, and exercise increases the trouble. The cystoscope often gives aid. The estimation of the quantity of hemoglobin and comparison with the amount of albumin in the urine will tell whether the albumin present is due entirely to the blood, or if there is also albuminuria. If there is excess of albumin, this indicates a probable renal source of the hemorrhage. Hemorrhage from renal calculus is usually slight, appears at somewhat prolonged intervals, and is increased by exercise. Bleeding from renal tumors is profuse, is apt to be more continuous, and is very likely to come on while the patient is recumbent. Tuberculous diseases cause hemorrhage which often occurs at long intervals, is of but slight severity, and not usually increased by exercise; and the quantity of albumin is usually in excess of that attributable to the blood present. Hematuria may also be due to passive hyperemia, or may follow a reflex inhibition of the renal functions, due to some acute abdominal affection acting upon the solar plexus. Cases of hematuria are becoming more and more the subjects of surgical treatment. It may be that simple incision in so-called idiopathic cases cures them by relieving the tension. Whatever the explanation, the results are often good.

R. H. Fitz⁴ discusses the **significance of albumosuria** in medical practice, and describes a case which occurred in a woman of 53, whose first complaint was loss of flesh and strength, with pain in the back of

¹ Wien. klin. Woch., July 30, 1898.

³ Lancet, July 2, 9, and 16, 1898.

² Wien. med. Woch., No. 15, 1899.

⁴ Am. Jour. Med. Sci., July, 1898.

the neck and between the shoulders. She subsequently developed a myxedematous condition, the eyelids growing puffy, the subcutaneous tissues about the neck and jaw becoming swollen, and, later, the extremities showing the same condition. The blood-examination showed 5,030,000 red corpuscles, 35% (!) of hemoglobin, and 11,600 leukocytes, the latter giving about a normal differential count. The urine contained from 0.12% to 0.25% of albumose. Under thyroid treatment the myxedema improved; but she lost weight and became thinner, the general condition improving when the dose was stopped. Smaller doses were then given, but the patient died. There seems to be but one other instance of albumosuria occurring with myxedema. Fitz considers albumose valuable chiefly in the diagnosis of latent tumors of the skeleton. He mentions such a case that was under the care of Shattuck. In this case albumose was discovered in the urine; after this the Röntgen rays were used, and the growths in the skeleton discovered. Fitz gives notes of a case in which thyroid extract was being given and sudden death occurred, apparently from severe syncope.

A. Ellinger¹ records a case of multiple lymphoma (myeloma) and lymphoid infiltration of the ribs, the vertebrae, and the sternum, which was associated with a picture similar to that of progressive pernicious anemia. During life the tumors could not be diagnosed, but there was present in the urine a considerable amount of albumose; and Ellinger insists even more strongly than previous writers on the importance of this sign in the diagnosis of obscure **multiple tumors of the skeleton**. He suggests that when this diagnosis seems established, some good might ensue from the use of large doses of arsenic. His chemie investigations of the albumose obtained show that it contained no phosphorus when properly purified, and therefore Mathes is in error in stating that it is a nuclealbumin. Albumose was found in the ascitic fluid; while investigation of the tumors and bone-marrow for this substance gave doubtful results.

J. Müller² has shown that a moderate degree of **acetonuria** occurs in healthy persons when they are put upon a diet absolutely free from carbohydrates. He discusses the 2 possible conclusions to be drawn from this, which are either that the carbohydrates aid in the complete oxidation of the intermediary products of metabolism, or that they inhibit the formation of acetone. The latter is the true action; and they seem to inhibit its formation in the gastrointestinal tract, since if they are introduced otherwise than by the mouth, by subcutaneous injections or by enemas, they have no effect upon acetonuria.

H. Benedict³ has added to previous investigations some of his own concerning the **excretion of neutral sulphur** in the urine. Dogs, normal men, and others suffering from diseases associated with marked destruction of tissue, as, for instance, cases of phthisis and typhoid fever, were investigated over a considerable period of time. His results are additional proof of the fact that the amount of neutral sulphur in the urine is in no way an indication of the condition of the nitrogen-metabolism. The quantity of these products bore no relation to the amount of nitrogen,

¹ Deutsch. Arch. f. klin. Med., Band 62, Hefte 3 u. 4.

² Verhandl. d. Congress f. inn. Med., Wiesbaden, p. 448, 1898.

³ Zeit. f. klin. Med., Band 36, Hefte 3 u. 4.

whether the nitrogen of the urine was derived from the food-proteids or from the tissue-proteids. The relation of **acetone** to destructive metabolism was also investigated, with the same result as in the case of neutral sulphur, excess of acetone seeming at most to indicate only a negative nitrogen-balance. The circumstances attending increase or decrease of the amount of neutral sulphur in the urine were similar to those which cause changes in the amount of the alloxur-bodies, especially of uric acid, increase occurring independently of the general metabolism when there was a marked increase in the nuclein-destruction. It is therefore possible that the neutral sulphur may be derived from some special portion of cells. The neutral sulphur cannot be considered as a product preliminary to the formation of sulphates, though with marked destruction of fatty tissues part of the unoxidized sulphur does form SO_3 .

Nephritis.—O. Reichel,¹ in order to investigate the question of the **nature of nephritic edema**, has injected salt solution into the subcutaneous tissues of individuals with nephritis and into those with cardiac dropsy, other cardiac diseases, local stagnation of the circulation owing to varicose veins, and similar conditions, and also in healthy persons. He found that 50 cc. of salt solution were rapidly absorbed, excepting in the cases of nephritis; in those individuals swelling and induration of the tissues persisted sometimes 5 to 10 days. He therefore decides that in nephritis there is such an alteration of the tissues that they become unable to absorb fluids, and this is considered to be due to retention of toxic substance resulting from the disease of the kidneys.

K. B. Hofman² has investigated the question of the occurrence of **carbonic acid** in the body-fluids in **eclampsia**. He obtained cerebrospinal fluid from an eclamptic patient. This was clear, of alkaline reaction, and had a specific gravity of 1009. The quantity of albumin was exceedingly small, and examination with Nylander's reagent was negative. Other reagents showed that instead of the alkaline carbonate usually present in this fluid, there were large amounts of an ammonium salt, which he believed was the carbamate. Therefore, he says, it is probable that in eclamptics there is usually in the cerebrospinal fluid an enormous quantity of ammonium salts, chiefly the urate; that the same excessive quantity is probably present in the other fluids of the patient, and it is likely that there is some systemic poisoning from ammonium urate. But, as Hofman very justly remarks, more extensive analysis must be made before this can be considered a final conclusion.

A. Chauffard³ believes that in many kidneys one may find that coincident with the progress of a chronic nephritis in certain parts of the organ, there is enlargement of other parts in attempted **compensatory hypertrophy**. Sometimes one kidney may be found entirely atrophied, while the other is relatively or absolutely enlarged; and many times there will be found nodules on the surface of the kidney, which, when examined, will be found to be normal or hypertrophied renal tissue surrounded by atrophic tissue. A case is reported in which the left kidney was found extremely atrophied and its surface finely granular; but there were several prominences the size of a hazelnut. The right kidney was

¹ Centralbl. f. innere Med., Oct. 15, 1898.

² Ibid., July 16, 1898.

³ Sem. méd., Dec. 21, 1898.

nearly 3 times the weight of the left, though actually somewhat atrophied. Its surface was covered with large nodules. Microscopic examination showed that these nodules consisted of renal tissue, apparently hypertrophic, while the surrounding tissue was sclerotic.

G. Diebella and L. Ketly¹ have investigated the **relation** existing **between albuminuria, hydremia, and dropsy** in nephritis. They found that in investigating the relation of the hemoglobin to the specific gravity of the blood, 10% of hemoglobin corresponded to 4.46 specific gravity, according to Hammerschlag's method; and the difference in the ratio between the hemoglobin and the specific gravity, as determined by the method mentioned, was considered to be due to a variation in the quantity of water in the blood. They found a fairly constant relation between the degree of hydremia and the amount of the albuminuria. The hydremia showed no constant relation to the hemoglobin, but varied inversely as the specific gravity of the blood. They divide cases into 3 groups; these show a considerable amount of dropsy, a slight amount, and none; and these groups bear inverse relation to the amount of hemoglobin, to the number of red cells, and to the daily quantity of urine, but a direct relation to the daily amount of albumin excreted. They show no relation to the specific gravity of the urine. The hydremia had no relation to the dropsy; but there was believed to be some relation between the hydremia and the albuminuria.

C. F. Martin² determined the amount of the **alloxur-bases** and of uric acid in a number of **cases of nephritis**. The conditions found were practically normal; the xanthin-bases varying from 13.6 mg. to 47 mg. per day, as determined by the Salkowski method; and the uric acid from 286 mg. to 445 mg. There is therefore no basis for teaching that the amount of these substances is altered in cases of nephritis.

A. R. Edwards³ reports 3 cases of **nephritis without albuminuria**, and discusses the diagnosis of the condition. Most commonly careful and repeated chemic and microscopic examination of the urine will detect either acute or chronic nephritis; but the urinary changes may be absent, and therefore the other signs of nephritis are essential in the diagnosis, and must, when present, give rise to a suspicion at least of the disease. Albuminuria may be absent in the various forms of the disease, even in the acute variety, though it is most commonly absent in interstitial disease. The search for casts is more important than the chemic examination; but there should always be careful examination of the cardiovascular system and of the retina.

J. T. MacLachlan⁴ describes a case of Bright's disease which was accompanied by violent **maniacal delirium**. The man was the subject of lead-colic, and had had nephritis for some time; after taking to his bed he became wildly delirious and had convulsions; subsequently he was maniacal, and had to be forcibly controlled; he presented illusions of identity. Such a condition persisted for 2 weeks, and following this, for 2 weeks' time until his death, he remained semicomatose. The temperature was normal and there was no paralysis. The production of free urinary secretion had no effect upon the mental symptoms; these were

¹ Deutsch. Arch. f. klin. Med., Sept. 6, 1898.

² Centralbl. f. innere Med., June 17, 1899.

³ Am. Jour. Med. Sci., Oct., 1898.

⁴ Glasgow Med. Jour., July, 1898.

somewhat quieted by the use of morphin, but they soon returned after each dose.

M. Pehu¹ discusses the criticisms that have recently been passed upon the **value of tube-casts** in establishing the diagnosis and prognosis of disease of the kidneys. In order to make this question more clear, if possible, he has studied all the records of cases in Bard's clinic for several years past in which there was any record of albumin or casts in the urine; and as far as possible he has made this study in connection with postmortem records. As a result, he concludes that the search for casts and the study of their character are of great importance in the diagnosis and prognosis of nephritis, and that criticism of their value is based purely upon a lack of appreciation of the varying importance of the different forms of casts. He divides them into casts resulting from transudation, this form including the hyaline and fibrinous and red blood-cell casts; those of desquamation, which form includes the colloid, fatty, amyloid, and epithelial casts; and finally those due to proliferation of the epithelium. He has concluded that granular casts are absolutely diagnostic of epithelial nephritis, and that their presence in greater or less quantity, and their persistence, are sufficient to establish an absolute diagnosis of nephritis of the convoluted tubes. The other varieties of casts are of less diagnostic value. The hyaline casts usually mean a disturbance of the circulation, but they have no characteristic diagnostic significance. The prognosis of nephritis may be based largely upon the number of the casts, their length, and the number of the granules. In the acute stages they are more numerous and the granulations more compact; and as the disease grows subacute the number of casts and of granules becomes less, while the diameter of the casts increases. If the disease tends to become sclerotic, the number of casts constantly diminishes; if it tends to run a course especially affecting the parenchymatous tissues, the casts remain present in large numbers.

R. C. Cabot and F. F. McGirr² have investigated the value of **methylene-blue in the diagnosis** of renal disease, and decide that it is a useful method for determining the presence of interstitial nephritis. Such cases begin to show blue color of the urine, on the average, 7 hours after the administration of the methylene-blue; while in normal cases it was seen, on an average, after $1\frac{1}{2}$ hours. Individuals with other forms of nephritis showed, at the most, no delay in the excretion of the dye. The interesting fact is noted that after subcutaneous injections there was not only much pain and swelling directly following the procedure, but there was anesthesia of the skin, which in 2 cases lasted for about 6 months, and which Gaylord suggested was due to a vital staining of the terminal nerve-filaments.

Achard and Delamaire³ state that the reaction to the subcutaneous injection of phloridzin may be used as a test of the **kidney activity**, since those with diseased kidneys will not show glycosuria at all, or present it in only a less degree than normally, or after a more considerable period.

C. Achard and P. Morfaux⁴ report a case of tuberculosis in which

¹ Rev. de Méd., Feb. 10, 1899.

² St. Paul Med. Jour., Feb., 1899.

³ Compt. rend. de la Soc. de Biol., Jan. 29, 1899.

⁴ Gaz. hebdom. de Méd. et de Chir., 1899.

in the later stages were evidences of inflammation of the kidneys; urobilin and indican ultimately disappeared from the urine, while the blood still contained urobilin. They consider this an evidence of **loss of permeability** of the kidney to the passage of urobilin. Experiments comparing healthy persons with others the subjects of disease of the kidneys, showed that in the former hypodermic injections of urobilin were soon followed by excretion of this substance in the urine; in those with kidney-disease this did not occur, and the blood sometimes was found to contain traces of urobilin. They think such injections may be used, therefore, as a test of the permeability of the kidney.

A. V. Korányi¹ has investigated the influence of diet upon the **lowering of the freezing-point** of the blood, particularly in cases of nephritis. He finds that the determination of the freezing-point of the blood is of great importance in estimating the amount of excrementitious products retained. The freezing-point normally varies little from -56°C . It is elevated slightly in grave anemias and cachexias; but lowered by accumulation of CO_2 in the blood and by the retention of excrementitious products. In the latter case, oxygen does not cause the freezing-point to return to the normal; while in the case of accumulation of CO_2 , oxygen makes the freezing-point again -56°C . Acetone is another important factor in altering the freezing-point, lowering it markedly. It was also found that the diet had great influence, since when rabbits were fed on oats, then on carbohydrates, then on somatose, and finally on oil, the kidneys in all cases being removed, and the animals killed 5 or 6 hours later, it was found that the freezing-point of the blood was about normal in those fed on oats, depressed in those fed on carbohydrates, still lower when somatose was used, and lowest of all after the oil-diet. This makes it evident that the feeding must be uniform if the freezing-point is used as an element in diagnosis.

Treatment.—J. Tyson² presents his views upon the use of **iron and opium** in Bright's disease. He protests against the freedom with which these drugs are commonly used. Iron he recommends only when anemia is marked, and then only in cases of chronic parenchymatous disease. In acute nephritis there is marked anemia, to be sure; but other conditions are more important. Chronic interstitial nephritis contraindicates the use of iron, in his view, because iron checks secretion and produces constipation and headache. He does not believe that iron is a diuretic. Opium, he thinks, should be used only in case convulsions are present in acute nephritis, or in the convulsions of puerperal eclampsia. It is especially dangerous in old people for any purpose, as they are very likely to have unsuspected chronic nephritis.

E. W. Mitchell³ discusses the **treatment of uremia**. He believes that the condition is due sometimes to autointoxication resulting from tissue-destruction and imperfect elimination, sometimes to decomposition of food in the intestinal tract, and sometimes perhaps to resorption of secretions, following largely the teaching of Bouchard. In treatment, he has found veratrum viride very valuable. He insists that chloroform must not be used over too protracted a period in convulsions, since it destroys red blood-corpuscles. Morphin may with wisdom be used once

¹ Berlin. klin. Woch., Jan. 30, 1899. ² Jour. Am. Med. Assoc., July 23, 1898.

³ Ibid., July 30, 1898.

with convulsions in acute nephritis, but its frequent use he condemns. He objects also to the use of pilocarpin. He has found injections of salt solution useful; and if blood-pressure is high he recommends venesection.

De Lignerolles¹ has treated uremia by **injections of serum** from the renal vein, using serum from this source because it was believed to contain an **internal secretion** from the kidney. He asserts that the injections caused decrease of the headache and other nervous symptoms, the vomiting and dyspnea, and the albuminuria.

S. Ringer² believes that **morphin** should be used more frequently in albuminuria and nephritis. He considers this drug exceedingly valuable for the headache, sleeplessness, and dyspnea which occur in uremia.

W. H. Whitehead,³ found that in a case of syphilis with albuminuria the use of **potassium iodid** and **mercuric chlorid** caused marked improvement in the albuminuria; therefore he has since used these drugs in many cases of nephritis due to various causes, and states that within a month or two they have always caused marked decrease or entire disappearance of the albumin, and that if the treatment was continued for some time the albumin did not reappear even after years. The author accords an undue amount of importance to syphilitic diseases of the vessels in the causation of nephritis.

M. Einhorn⁴ discusses **movable kidney** and its treatment. He has examined 1315 patients, with a view of discovering the possible presence of this condition, and found 26 instances in which the kidney was movable. Among the male cases, 1.81%; among the females, 20.6%. Almost all were on the right side; in but 1 instance was the left kidney alone affected. About one-third of the cases showed ptosis of some of the abdominal organs. He has repeatedly found some of the hollow organs misplaced downward, without any evidence of movable kidney. Einhorn believes that there is an individual predisposition which is largely active in misplacement of the abdominal organs. He then speaks of the symptoms of the condition, and states that in treatment he considers the abdominal bandage very valuable, and prefers medical to surgical treatment.

C. W. Suckling⁵ has examined a series of 200 patients, equally divided between men and women, and found 42 instances of movable kidney in the women and 6 in the men. He finds that he discovers the abnormality more readily by **examining** the patient **in the erect posture**, grasping toward the kidney with extended fingers, rather than placing the flat hand on the abdomen. Among interesting symptoms which he has observed, he notes a tendency to ataxia and vertigo. Also, the patient often finds it difficult to retain the upright position for any length of time. He has frequently noted enlargement of the spleen. Occasionally he has seen attacks of epilepsy from the condition. A point in the etiology which he has noticed is the occurrence of the disease in numerous girls who serve beer, probably from their being obliged constantly to stoop and again stand upright almost immediately in drawing the beer. He finds that the symptoms are almost entirely controlled by a properly made belt, with a pad to fit over the region of the kidney. If this does not give relief, surgical treatment must be instituted.

¹ Lyon méd., Jan. 8, 1899.

² Jour. Am. Med. Assoc., Oct. 8, 1898.

³ Ibid., Aug. 6, 1898.

⁴ Med. Rec., Aug. 13, 1898.

⁵ Edinb. Med. Jour., Sept., 1898.

C. C. Allison¹ describes a case said to have been leukemia, which occurred in a woman of 42, who had had 8 children. Her abdomen was much distended, and she had at varying times attacks of sudden polyuria, at other times anuria. With the attacks of polyuria the abdominal distention decreased. The spleen was much enlarged; the blood-count given was 3,680,000 reds, 9,000 whites; 50% of the latter being eosinophiles. Allison believes that the spleen pressed upon the ureter, and that from this there was an **intermittent hydronephrosis**.

G. Rosenfeld² discusses the differential diagnosis between **pyelitis** and **cystitis**. The points he notes are the following: An alkaline reaction is not found in uncomplicated pyelitis; in cystitis, even of severe grade, the albumin in the urine does not amount to more than 0.1%, this being the most characteristic point of differentiation, for in pyelitis it is often as much as 3 times greater than this; if most of the pus-corpuseles present are crenated, the condition is probably pyelitis, which is also true in case the red corpuseles are decomposed; if any hemorrhage occurs, it is but slight.

R. Kratz³ discovered bacilli, having characteristics identical with those of the **influenza-bacilli**, in the urine from a case of pyelitis. It is not stated positively that the bacilli were influenza-organisms.

PARASITES.

Rader⁴ reports a case of a 3-years old child, whose stools contained ova of the **Tænia nana**. He states that this is only the second case discovered in Germany. The adult parasite was not found.

W. Zinn and M. Jacobi⁵ have examined a number of individuals who were living in Berlin, but were born in regions where intestinal parasites are common: 8 from Ceylon showed eggs of the **ankylostomum**, 7 of them the eggs of the **Trichocephalus dispar**, and in 6 the eggs of the ascaris. The individuals from Madras showed the presence of the ova of the ankylostomum and trichocephalus in their intestines, and the ascaris in almost all cases. The authors therefore think that the investigations prove that when these parasites once become common in a community they are likely to spread widely among persons who come in contact with those infected, a statement which they have previously made. They believe also that their previous statement, that the presence of the ankylostomum or of its eggs is not necessarily accompanied by any symptoms, is proved by these results, since the individuals examined showed no symptoms of its presence. They believe that its effect is produced both by abstraction of blood and by causing an intoxication.

J. Mathias⁶ records an epidemic of **ankylostomiasis** which occurred among the European miners at Kimberley. He believes that the ova probably find entrance into the systems of the miners owing to their eating with unwashed hands after working in the muddy tunnels. He states that a large percentage of the miners employed in the tunnels are affected, and he has himself treated 30 cases, 2 of which resulted in death. Thymol has given the best results in treatment.

¹ Med. Rec., Aug. 27, 1898.

³ Wien. klin. Woch., Oct. 13, 1898.

⁵ Berlin. klin. Woch., Oct. 4, 1898.

² Berlin. klin. Woch., July 25, 1898.

⁴ Münch. med. Woch., No. 11, 1898.

⁶ South African Med. Jour., Sept., 1898.

J. Goldschmidt¹ states that in recent years Machado has discovered that **ankylostomiasis is endemic** in the island of **Madeira**, there being 2 localities in which the disease is found. In 1 of these the affection was originally very severe and often caused death. The nature of the disease was unknown, and it was called simply jaundice, as this symptom commonly accompanied the attacks. Since it was found that the ankylostoma cause these cases, deaths rarely occur and the affection is being stamped out. The treatment used is thymol and filix mas. The experience in this region has been that the occurrence of many other intestinal parasites tends to kill the ankylostomum or to cause its disappearance.

M. Herzog² describes a case which occurred in a girl, 4 years old, and in which a living **Æstrus hominis** was found in a small abscess that developed on the lower part of the right chest.

G. Strube³ found large numbers of **Trichomonas hominis** in the stomach-contents from a case of cancerous stricture of the esophagus. These parasites showed active motility, due to 3 or 4 long flagella; they were oval in shape, possessed a long tail, and were 8 to 14 mm. in length. If the stomach-contents were allowed to stand for 24 hours, nonmotile bodies of a round shape were seen, and these, when placed upon the warm stage, became motile. *Trichomonas hominis* has been found not infrequently in the contents of the intestine and of cavities in the lungs. In this case they disappeared after 2 weeks' lavage with creosote solution. They were not present in the feces.

E. Cureton⁴ reports the occurrence of **bilharzia disease** in a scavenger, 41 years of age. The man had had dyspnea and anginoid attacks for some time before death, but had not been treated by a physician. The postmortem disclosed enlargement of the appendix without adhesions; there were nodules beneath the surface, which were found to be dense connective tissue arranged somewhat circularly around what seemed to be included parasites. The latter were present in large nodules in numbers ranging from 3 to 20. These showed imperfectly the appearance of the ova of bilharzia. Most of them, however, had lost their characteristic appearance.

O. Galgey⁵ has found the **Filaria demarquayi** in several parts of St. Lucia, in the West Indies. This parasite is so similar to the sharp-tailed form of the *Filaria ozzardi*, that Galgey believes the two are identical.

E. B. Sangree⁶ discovered what he believed was the **Filaria osleri**, in some sections made from a dog's lung. Salmon examined the incomplete specimen, and believed that it was the parasite mentioned above.

Schultz⁷ demonstrated a case of severe anemia in which he had discovered swarms of the **Colpoda cucullus** in the bowel-movements at repeated intervals, always when they were very loose.

Malfi⁸ reports the case of a woman who had for 4 years been passing per anum what she believed to be worms, but which proved to be **larvæ of Musca carnaria**. They were discharged from the rectum exclusively. Contrary to most of the cases previously reported, this patient had no vomiting or excessive thirst, nor other digestive disturbance. The larvæ were passed exclusively during the warm months.

¹ Deutsch. med. Woch., Apr. 6, 1899.

³ Berlin. klin. Woch., Aug. 8, 1898.

⁵ Brit. Med. Jour., Jan. 21, 1899.

⁷ Berlin. klin. Woch., page 353, 1899.

² Med. News, Mar. 4, 1899.

⁴ Lancet, Jan. 21, 1899.

⁶ Med. Rec., Aug. 27, 1898.

⁸ Riforma Med., July 22, 1898.

PEDIATRICS.

BY LOUIS STARR, M. D., AND ALFRED HAND, JR., M. D.,
OF PHILADELPHIA.

The Year's Work.—The contributions during the past year to the different subjects in the department of Pediatrics have been, in greater degree than usual, of such a high standard of excellence that it has been difficult to review them at the length that many of them deserve, and at the same time to remain within the limits necessarily set by the scope of the YEAR-BOOK. As compared with past years, we may seem to have slighted the subject of diphtheria; but although the number of articles was as great as formerly, the trend is similar to those noted in the last 2 issues of the YEAR-BOOK, with the exception that the antagonism to the antitoxin is steadily becoming less in amount, if not in violence. The subjects to which attention has been paid in greatest measure are those which, after all, are of the greatest importance—Hygiene, Infant-feeding, and the Disturbances of the Digestive Tract.

GENERAL CONSIDERATIONS.

L. Emmet Holt¹ treats of the scope and limitations of hospitals for children. He explains the high mortality that occurs in such hospitals as being due to the class of patients that are brought for admission. The diseases especially suited for hospital treatment are acute pneumonia, empyema, acute forms of gastrointestinal disease, otitis and its complications, ophthalmia, acute surgical cases, and most cases of eczema in children over 6 months old. Among the arrangements of the hospital, proper amount of air-space is given as 1000 cubic feet. After acute symptoms have subsided the patients should be discharged, as hospital marasmus tends to develop in many cases. Small wards holding 4 to 6 beds and small hospitals of not more than 60 beds are preferable to those double or treble in size. Australia² has undoubtedly the most civilized and humane mode of handling destitute children, placing them in homes, and not in Homes, there being no orphan asylums in the country. [We must mention here the work in this line, but on a smaller scale, done by the Children's Aid Society of Pennsylvania. Other similar societies exist, no doubt, in other States.]

Among the articles submitted to the French Commission of the Hygiene of Childhood was one by Caillot,³ on the causes and remedies for the depopulation in France. He urges the abandonment of the long rubber-tube nursing-bottle, the adoption of sterilized milk, and the estab-

¹ Phila. Med. Jour., Oct. 24, 1897.

² Ibid., Dec. 17, 1898.

³ Bull. de l'Acad. de Méd., Nov. 22, 1898.

lishment of a commission to see that nurses are paid their wages by the families; failure in this regard leads to neglect of the child by the nurse. An anonymous writer,¹ in the same collection of papers, makes the rather surprising recommendation that, if artificial feeding is necessary, whole milk should be given, even in the first week of life, as children fed on this rarely develop diarrhea and vomiting, which diluted milk is prone to excite, the only inconvenience arising from the use of whole milk being constipation; a second recommendation is the use of bismuth salicylate as an aid to digestion, when milk begins to disagree, and as an intestinal antiseptic and sedative in enteritis, in the large doses of 5 gr. (8 gr.) for infants up to 1 month old, 2 gm. (33 gr.) in the second month, and 3 to 4 gm. (1 dram, nearly) after the fifth month. He states that if symptoms of intoxication arise, they will rapidly subside on the withdrawal of the drug; the only contraindication is when its use aggravates the diarrhea, in which case examination of the urine will show that the medicine has not been decomposed in the intestine. Barthès² treats of the causes of infant mortality in the first year, laying stress on the importance of weighing infants regularly, on the use of sterilized milk, on the suppression of the long-tube nursing-bottle, and on not giving solid food prematurely. Hèbert,³ on the same question, in addition to the points already mentioned, finds that there is a great tendency to wean children suddenly and prematurely, with fatal results: the practice of giving a newborn child some concoction like a little wine in sweetened water, and the observance of the rite of baptism in a cold church, with exposure of the infant, are deprecated; and the fact lamented that mothers are often obliged to work all day, necessitating artificial feeding of the infants.

Sleep.—H. Gillet⁴ writes on certain hygienic points in regard to sleep for children. The time to be spent in sleep varies with the age, the infant in the first month or two sleeping all the time except when suckling, and then beginning to waken for increasing lengths of time; the custom of sleeping after a daily outing should be kept up at least until the fourth year; the infant should be taught at the start to go to sleep naturally, without rocking or singing, and thumb-sucking at the time of going to sleep should be prevented. The following rules are given as the hygiene of sleep: 1. The child should always be put to bed at the same hour. 2. Relative quiet and darkness are requisite in the child's room; relative only, since it is necessary that the child should sleep in spite of the presence of other people who are not making much noise; a strong light should not be allowed to fall directly upon the face of the child. 3. The temperature of the room should be moderate, since excess of either heat or cold is hurtful, the latter less so if the child is well protected. 4. Aëration should not be inconveniently confined—there must be no curtains shutting off the air. 5. Waking should take place at nearly the same hour; or at least the child should not be so aroused as to cause any great variation from its habitual time of repose. The sleep of young children should not be cut short under any pretext whatever, until it has overreached the usual time; but it is often requisite to allow an overplus of sleep demanded in consequence of growth. Sleep and proper nourish-

¹ Bull. de l'Acad. de Méd., Nov. 22, 1898.

² Ibid.

³ Ibid.

⁴ Ann. de la Polyclin. de Paris, June, 1898; N. Y. Med. Jour., July 2, 1898.

ment are the best repairers of overfatigue; but this must not be allowed to induce a slothful habit, for excess of sleep retards general nutrition. L. Ott¹ discusses some of the manifestations of disease which occur in children during sleep, and are therefore apt to be overlooked; seat-worms and hives may very often cause restlessness in sleep, and may not be noticed by the mother or physician; night-terrors, unconscious masturbation, enuresis, and nocturnal pains are also considered.

Reflexes.—We can only refer here to H. Pfister's² extensive study of the state of the pupils and ocular reflexes in infants and young children.

Growth.—F. Proscher³ has shown, with reference to the rapidity of growth of sucklings, that it bears a definite relation to the contents of the mother's milk in albumin and salts, this holding as well for man as for the lower animals; thus, the human infant doubles his weight in 180 days with 1.86% of proteid in the mother's milk, the horse in 60 days with 2.3%, the calf in 47 days with 4%, the pig in 18 days with 6.89%, the sheep in 10 days with 7%, the dog in 8 days with 8.28%, and the cat in 5 days with 9.53%. The author draws a parallel between the milk of animals in southern countries—the camel, horse and ass—which is poor in fat and rich in sugar, and the carbohydrate diet of man in those regions; while in the north, the reindeer, for example, gives a milk rich in fat, the diet of human beings there having also a large amount of fat.

Temperature.—P. Budin⁴ discusses the lowering of temperature which occurs in newborn children, especially if premature. Some remarkably low temperatures were observed, ranging from 35° to 25° C. (65° F.), the latter being the rectal temperature recorded in a premature infant with sclerema; of 142 infants with rectal temperatures of 32° C. (89.3° F.), only 3 survived, a mortality of almost 98%; other observations on infants of similar weight, whose temperatures were not allowed to fall, gave a mortality from all causes of 26.5%; the influence of weight in the prognosis is shown by the records of 72 infants, with temperatures between 32° and 33.5° C., weighing 1500 gm. or less, 2 of whom survived; while of 83 weighing between 1500 and 2000 gm., with temperatures between 32° and 33.5° C., 12 lived. Hervieux⁵ refers to a communication of his in 1855, in which he described the same conditions under the term "progressive chilling of the newborn," excluding from this category all cases of sclerema. In the discussion, Guéniot⁶ called attention to his writing on the same subject in 1872, and mentioned in the treatment, besides external warmth, appropriate nourishment and massage.

Weight.—J. P. C. Griffith⁷ discusses the different published weight-charts for infants, and the methods employed for determining the normal increase in weight of a healthy child, and gives a chart for the first 2 years of life. M. G. Durante⁸ reports some observations on the prognostic value of an increase in weight of children having some grave disease, like tuberculosis, athrepsia, syphilis, etc. He found that from 3 to 6 days before death, without discoverable cause, the weight increased from 1 to 9 oz. in a number of such cases.

¹ Med. News, vol. lxxii., No. 25.

³ Zeit. f. physiol. Chemie, No. 3, 1898.

⁵ Ibid., Apr. 4, 1899.

⁷ N. Y. Med. Jour., Mar. 4, 1899.

² Arch. f. Kinderh., Band 26. Hefte 1 u. 2.

⁴ Bull. de l'Acad. de Méd., Mar. 14, 1899.

⁶ Ibid.

⁸ Ibid., Aug. 13, 1898.

Play.—J. H. McKee,¹ in a paper on the developmental influences of play, calls attention to the influence of play in the development of the lower animals, showing that the beneficial results are not confined to motor and psychomotor functions, but that the animal might be advanced through play to a higher plane of intelligence. Spontaneous play may produce similar results in the case of the child, the muscles, the spinal centers, the basal structures, the psychomotor centers, the intellectual centers and the association-centers share in a common development. The pedagogist knows what Basedow achieved through the medium of play, and how much stress Froebel laid upon the same agency; the psychologist can advance many reasons in the support of play as a developmental factor: the child's attention is engaged thereby; play affects him in an agreeable manner; and plays are probably genetic in character, etc. Following Gulick, numerous plays are mentioned which characterized the different periods of infancy, childhood, and adolescence. Some examples of gross parental ignorance are cited: and the paper closes with a discussion of the *moral* and *sociologic* aspects of the question.

Urine.—F. S. Churchill² contributes a valuable addition to the study of the urine of healthy infants and children: 146 specimens were analyzed from 70 children, inmates of an asylum, the tables on page 255 showing the points of investigation and the results.

Inanition-fever.—F. M. Crandall³ reports 2 cases of inanition-fever, which term, he thinks, is the best yet suggested for the fever seen in some infants during the first 3 days of life, and apparently dependent on lack of nourishment; the diagnosis is to be made by exclusion.

Fever.—S. S. Adams⁴ treats of fevers in children, giving as the principal causes physiologic ferments and nonpathogenic and pathogenic bacteria. The ease with which the temperature fluctuates in children is mentioned, and an appeal made to treat the general condition of the patient rather than the degree registered by the thermometer; for the treatment, the coal-tar products are characterized as unsafe even in skilful hands, and the benefits of hydrotherapy are clearly stated. [We must emphasize the grave danger of the use of the coal-tar products as antipyretics.]

Premature Infants.—S. W. Ranson⁵ shows the importance, by quoting French statistics, of caring for premature infants, in order that the population may increase in the proper proportion; he mentions Lyman Beecher as an example, to show that premature infants are not necessarily delicate in after-life; a useful device is suggested for country practitioners, who cannot command a complete incubator such as may be found in large cities; Ranson's plan is to use 2 metal bath-tubs for children, one several sizes smaller than the other; the smaller is placed in the larger, with 2 in. of water between them, and 1 or 2 kerosene lamps are placed beneath them, thus maintaining an equable temperature at any height desired, even in the coldest weather. [We have also found a sitz bath-tub useful in a somewhat similar way, bottles of hot water being placed on the bottom and a swing of broad muslin suspended above them.] G. F. Blacker⁶ gives, among the other well-known points in the care of

¹ Arch. of Pediatrics, May, 1899.

² Ibid., Sept., 1898.

³ Ibid., Mar., 1899.

⁴ Ibid., Apr., 1899.

⁵ Northwestern Lancet, Dec. 15, 1898.

⁶ Practitioner, July, 1898.

Age.	Weight.	Sex.	Total specimens.	Amount.	Specific gravity.	Urea.	Total urea.	Chlorids.	Phosphates.	Sulphates.	Amount to 1 kilogram body-weight.	Urea to 1 kilogram body-weight.
Years.	Kg.			Cc.		Per cent.	Gm.	Per cent.	Per cent.	Per cent.	Cc.	Gm.
3	16.8	2 M.	5	358	1024.0	2.2	7.87	12.50	12.00	1.08	21.3	0.468
4	16.9	{ 7 M. 4 F.	31	299	1027.1	2.9	8.67	11.17	9.22	1.41	17.6	0.513
5	16.8	{ 1 M. 7 F.	17	392	1024.5	2.6	10.19	10.37	8.89	1.13	23.3	0.606
6	16.7	2 F.	2	405	1023.0	2.7	10.94	11.00	6.50	1.13	24.2	0.655
7	20.9	{ 1 M. 3 F.	4	564	1018.0	1.1	6.20	7.00	5.63	0.85	26.9	0.296
8	22.6	{ 2 M. 7 F.	20	628	1021.1	2.2	13.82	9.16	7.32	1.11	27.8	0.611
9	26.2	{ 1 M. 9 F.	25	731	1020.7	2.3	16.81	8.46	7.61	1.10	27.9	0.641
10	27.5	{ 2 M. 6 F.	15	768	1023.5	2.1	11.28	9.29	6.85	1.10	27.9	0.592
11	27.2	{ 1 M. 3 F.	7	716	1018.8	2.3	16.83	10.03	7.50	0.92	26.3	0.618
12	36.4	{ 2 M. 3 F.	8	829	1021.5	2.8	23.21	9.27	6.77	1.00	22.7	0.637
Totals	.	{ 19 M. 44 F.	134									

Age.	Weight.	Sex.	Amount in single specimen.	Twenty-four-hour amount.	Specific gravity.	Urea.	Chlorids.	Phos- phates.	Sulphates.	REMARKS.
1 day	3.18 kg.	F.	3 cc.	. . .	. . .	0.4%				
12 days	3.86 kg.	. . .	36 cc.	. . .	1003	0.1 "	Passed at 12 M.			
3 wks.	4.14 kg.	. . .	. . .	. . .	1001	0.5 "	"	"	9 A.M.	
3½ "	4.25	. . .	30 cc.	. . .	1005	0.2 "	"	"	4 P.M.	1 hr. after breast.
4 "	4.47	M.	23 cc.	. . .	1004	0.1 "				
1 year	9.98	. . .	9 cc.	. . .	1021	2.6 "				
1 "	. . .	. . .	. . .	. . .	1026	2.7 "	12%	16%	1.75%	Dentition slow.
1½ yrs.	. . .	F.	. . .	195 cc.	1030	2.5 "	18 "	11 "	1.25 "	1 specimen.
13 mos.	9.76 kg. (21½ lbs.)	F.	. . .	. . .	1026	2.3 "	11 "	11 "	1.00 "	Mixture night and day urine.
20 "	. . .	. . .	. . .	290 cc. +	1028	2.8 "	16 "	13 "	1.75 "	
20½ "	. . .	M.	. . .	325 cc. +	1026	2.1 "	8 "	12 "	1.00 "	
2 yrs.	14.07 kg (31 lbs.)	M.	. . .	450 cc.	1020	1.7 "	6.5 "	6 "	1 "	
		{ 3 M. 3 F. }	12 specimens in all.							

premature infants, one that is often overlooked—the exclusion of light. In the feeding of such infants the mother's milk is often unsuitable, and a low modification (fat, 1; proteid, $\frac{1}{2}$; sugar, 3) may be given in small amounts, 1 or 2 teaspoonfuls every hour.

INFANT METABOLISM AND FEEDING.

O. Heubner¹ makes some observations on the results of a study of the metabolism of infancy with different methods of feeding. A detailed report is made in conjunction with Rubner,² a preliminary report having been mentioned last year.³ The first studies were conducted on a breast-fed infant, 9 weeks old, weighing at the start 5230 gm., and under observation 9 days, at the end of which time it weighed 5250 gm. (11½ lbs.). The mother's milk, owing to the strangeness of the laboratory surroundings, was somewhat lower in quality and quantity than before and after the observations, the child obtaining only 608, instead of 800, gm. of milk daily, having, instead of 100, only 72 calories for each kg. of body-weight. The second child under observation was a well-developed infant, 7 months old, weighing at the start 7570 gm. (16.6 lbs.), and 7700 gm. 7 days later, at the end of the study; from the third month of age the method of feeding had been about a liter daily of undiluted cows' milk, to which 30 gm. of milk-sugar were added; this method was undisturbed during the observations, the milk being obtained from the same dealer as before, and being found clean from a bacteriologic standpoint. The third infant, 3½ months old, weighing 2935 gm. (6½ lbs.), was observed for 7 days, being fed for the first 4 days on diluted sterilized milk, gaining 55 gm. (about 2 oz.), and then for 3 days on a prepared food, losing in this time 70 gm. Subsequently, with careful nursing, the child developed a robust state of health. The first child received 73 calories, instead of 100, as it should; and, although not gaining, yet it did not lose in weight. The second child received 96 calories, while the normal for its age and weight is 86; but its gain in weight was only the average, so that there was more waste than in the first child. The third child exceeded even the second in waste, taking in 126 calories per kg. of body-weight while on the milk-diet, the normal being 103, but making such poor use of it that the daily gain was only 14 gm., or 10 less than the normal average. When fed on the meal-soup, the ingested calories were 66, only 7 less than the breast-fed child; and yet, while the latter held its own, the atrophic child lost 20 gm. daily. Comparing the first and second patients, the first took in 5.9 gm. of albumin per kg., eliminating 16.9% of the N in the feces; while the second took in 28 gm. of albumin, and eliminated only 6.4% of the N by the bowel; but the latter excreted per kg. of body-weight 0.44 gm. of N daily in the urine, while the first excreted only $\frac{1}{4}$ as much, or 0.107 gm. The second child could, without injury, have had the nitrogen it ingested reduced. The third child took in 3.8 gm. of albumin, and eliminated 18.5% of the N in the feces, only a little more than the first child; but a striking difference was shown in handling the fat, the healthy child allowing only 5.7% to go to waste, the atrophic one, 15.6%. The

¹ Berlin. klin. Woch., Jan. 2, 1899.

² Zeit. f. Biol., Band 36.

³ YEAR-BOOK for 1899, p. 607.

inference from the above, that a starving child assimilates with greater power than a healthy one the proteid element of food, was upset by the results of the meal-soup diet in the atrophic child, in which, of the 0.32 N ingested, 43.7% was eliminated in the feces. The reason for this latter event is to be found in the form of proteid, for, as Röhmann has shown, the casein is needed for growth more than the other proteids in milk, because it contains a nuclein compound with phosphorus needed by the nucleus of the growing cell. The experiments showed the value of the nonnitrogenous elements of food in serving to protect the nitrogenous from useless waste while building up the organism. In healthy children, like the first and second, the carbohydrates and fats are of equal importance; but in children like the third, atrophic and with feeble digestion, even with a diet poor in fat, a large amount of it goes to waste, and in such cases asses' milk is to be recommended, with its low fat and high carbohydrate content. The observations have shown, as Heubner has asserted before, that casein is not an indigestible proteid, either in human or cows' milk; and it is harmful only when, through overfeeding, it leads to excessive fermentation, as, in fact, do both the carbohydrates and fats. Further, the only reason for giving a milk richer in proteid than human milk is to avoid introducing an excessive amount of water, which burdens the system just as surely as does overfeeding. Similar studies were made by Michel and Perret,¹ on an infant 2½ months old, analyses being made of a sample of each feeding, and the excreta also being collected and analyzed; the aim was to measure the partial gains in weight due to albumin, mineral salts, lime, phosphoric acid, and chlorin; the gains of these for each day were: albumin, 5 gm.; mineral salts, 0.526 gm., of which 0.149 gm. was lime, 0.121 gm. was phosphoric acid, and 0.069 gm. was chlorin.

A. B. Marfan² also treats of the nutritive changes in nurslings, the article being a summary of a monograph on the subject,³ which discusses certain physiologic data with reference to healthy breast-fed infants. While these data are as yet very incomplete, the inferences drawn are thoroughly justifiable; many of the data are drawn from a study of the physiology of adults. The amount of food-stuffs required by an adult weighing 70 kg. is, on an average: Albumin, 100 gm.; fats, 50 gm.; carbohydrates, 450 gm., the total furnishing about 37 calories a day for each kg. of body-weight. As 1 gm. of albumin gives 4.1 calories, 1 gm. of fat gives 9.3 calories, and 1 gm. of carbohydrates gives 4 calories, the 2515 calories ingested daily are derived in the proportions of 410 from the albumin, 400 to 450 from the fat, and 1600 to 1800 from the carbohydrates. The need for albumin is fairly constant; but the fats and carbohydrates are, within limits, interchangeable for a short time, although, if one is given in excess very long, it ceases to be digested, and bad results follow. After considering the needs of the organism for water and mineral salts, the fundamental difference between the objects of nutrition in childhood and adult life are stated to be, for the one, growth; for the other, renewal of substance, maintenance of warmth and of functions. The infant, in order to grow,

¹ Rev. mens. des Mal. de l'Enfance, May, 1899.

² *Ibid.*, Nov., 1898.

³ *Traité de l'allaitement et de l'alimentation des enfants du premier âge.* G. Steinhil, edit., 1898.

ingests, per kg. of body-weight, twice as much albumin and 5 times as much fat as an adult. The relation of proteid to other ingredients in the dietary is, for an adult, 1 : 5; in woman's milk, 1 : 6; and in cows' milk, 1 : 3. According to Bunge, 1 liter of woman's milk furnishes 650 to 700 calories; and 1 liter of cows' milk, 700 to 750 calories [a very important point to be borne in mind in directing the preparation of cows' milk for infant-feeding]. An infant 3 months old, taking 800 cc. of breast-milk, ingests, then, 100 calories per kg. per day, or about $2\frac{1}{2}$ times as much as an adult; while an adult at rest evolves about 32 calories per kg. per day, an infant produces about 80, or considerably more than an adult at hard work. Both classes derive about the same amount of warmth from 100 calories of albumin ingested; but while the adult derives 30 from the fats and 51 from the carbohydrates, the infant reverses these figures, taking 53 from the fats and 29 from the carbohydrates; this preponderance of fat is of importance for the growth of the child, for it serves to lessen proteid-destruction and enables the proteids [casein especially] to build up the tissues. Space fails us to devote extensive consideration to this interesting and important contribution, which, in addition, discusses the analyses of the excretions, the effects of deficient nourishment, in which the fats are first drawn upon and then the proteids, the stored-up carbohydrates (glycogen) being practically of no account. The effects of excessive nourishment vary, of course, with the special food-stuff taken in too large amounts; it is to be borne in mind that the infant can take in and store up, because of its growth, a greater excess of proteid above its normal diet than an adult can; and, further, that when a greater amount of proteid is ingested than an infant can handle, indigestion occurs, which prevents excessive absorption of nutriment. If cows' milk is badly digested, it is usually due to the high proportion of casein in it; when the carbohydrates or fats are ingested in excessive amount, the proteid is shielded from oxidation, and a larger amount of it is stored up as muscle, the nitrogen eliminated in the urine being lessened. This happens more readily with an excess of carbohydrates than of fats; but infants on a milk-diet rarely undergo this; if fed too largely on farinaceæ, digestive troubles result, which prevent the excessive ingestion from leading to excessive absorption; if the excessive alimentation is not qualitative, but is merely quantitative, there results either a marked disturbance of digestion, which leads to wasting, or a slight disturbance of digestion accompanied by obesity. In older infants, who take, in addition to a milk-diet, fat broths, meats, bread and wine [which rarely occurs in America], a state of gout develops, analogous to that of adults. With reference to the feeding of infants with digestive disturbances, the author criticises Czerny's¹ conclusions with regard to fat causing acid-intoxication, as being based on the amount of ammonia in the urine, the determination of which is a delicate procedure and subject to great error; and while the author does not deny the existence of acid-intoxication, he thinks that there are other more important features.

¹ *Infra*.

INFANT-FEEDING.

Cartens,¹ in discussing the advantages and disadvantages of **sterilized milk**, lays emphasis on the greatest possible cleanliness in dairies, and the use of the "reform milk-pail" [which is not described]; boiling for 10 minutes is sufficient, if these precautions have been observed. Clean, fresh milk may advantageously be sterilized at the dairy for 30 minutes, the different mixtures for the different ages being prepared before sterilization. The exclusive use of sterilized milk after children are 9 or 10 months old is not to be recommended; if a child reaches this age in the summer months, it may be given, in addition to sterilized milk, soup, zwiebach, farinaceous foods, rice, fresh vegetables, etc.; but if this age is reached in winter, then sterilization can give place to boiling of the milk. [With a good supply, it seems to us that, in winter, even bringing the milk to the boiling-point is unnecessary.] The author mentions scurvy, anemia, and rachitis as likely to follow too prolonged use of sterilized milk.

Von Stark,² with reference to the same question, has received answers from 300 physicians in the province of Schleswig-Holstein, 28% of whom reported disadvantages, chief among them being retarded development, anemia, dyspepsia, rachitis, and obstinate constipation. The author gives quite a list of infant-foods, heading it with Gärtner's fat-milk, which is extensively used, but which, according to Czerny, does not act better than dilutions of cows' milk for children with intestinal disorders; 2 cases of scurvy following its use are reported, and sometimes there have occurred retarding of growth, anemia, and rachitis. Biedert's cream-mixture, Voltmer's artificial mother's milk, somatose-milk, Rieth's albumose-milk, and Pfund's fat-milk, all have a larger or smaller number of cases of scurvy to their credit; that the diet is responsible for the disease is seen by the results of changing the food. The author states that the determining changes which sterilization produces in milk are not known. Ordinary boiling, as in home-sterilization, lessens the amount of soluble lime-salts, separates the albumin; in part, drives off gases, and destroys certain aromatic products; prolonged heating will destroy the emulsion by dissolving the proteid envelope of the fat, will "caramelize" the milk-sugar, will destroy lecithin, and, finally, also the phosphorus-molecule. The last set of changes is, of course, far more deleterious than the first. The changes which sterilization produces may not be so important, after all, as the unchanging uniformity of the diet for months at a time; but these changes may be avoided and milk rendered free from pathogenic germs by pasteurizing.

In the discussion³ on Cartens's and von Stark's papers, in the Congress at Düsseldorf, Heubner⁴ mentioned his investigations on the **metabolism of bottle-fed infants**, which showed that the need for N in the growing infant-organism is not constant for all children, but varies with individuals, and is dependent on the amount of nonnitrogenous food taken. Healthy children seem to bear large amounts of albumin without harm; and Heubner thinks that a larger amount of albumin than is absolutely necessary produces less harm than too large an amount of fluid. Schloss-

¹ Berlin. klin. Woch., Nov. 14, 1893.

³ Ibid., Nov. 21, 1898.

² Ibid.

⁴ Loc. cit.

man spoke of the one-third dilution of milk (water, 2; milk, 1), which Cartens recommends for the first months of life, as necessitating the introduction of so large an amount of fluid to give the necessary calories as would lead to gastrectasia. Czerny deprecated the inference that might be made, that, because some infants bore well a large amount of albumin, therefore all infants need a diet rich in proteids. Von Ranke has seen so few cases of scurvy in Munich, where sterilization is perhaps more generally used than elsewhere, that he inclines to the belief that local conditions are of influence. Escherich has had uniformly good results with **Gartner's fat-milk**; he raises the question whether the good results following the use of uncooked milk are not dependent on ferments present in the milk [the destruction of which, by boiling, leads to unfavorable developments], but which have not as yet been discovered in cows' milk.

Schmid-Monnard,¹ in speaking of the artificial feeding of healthy children, calls attention to investigations which show that the **daily calorie** need (131) of this class is greater than that of breast-fed children (99), due to the deficiency of cows' milk in fat and carbohydrates [when diluted].

Keller and Gregor² report on the use of "**malt-soup**" for the artificial feeding of infants with intestinal disorders. Of 74 cases, 7 died of the intestinal trouble, 6 of intercurrent diseases, 3 were unimproved, 17 improved, and 44 were made well through "the influence of the feeding-therapy." Keller³ gives the following directions for the preparation of the malt-soup: 50 gm. of wheat-flour are beaten up with $\frac{1}{2}$ liter of cows' milk and strained through a sieve; in another vessel, 100 gm. of malt-extract are dissolved in $\frac{2}{3}$ liter of water at 50° C., and to this mixture are added 10 cc. of a 11% potassium carbonate solution; the malt- and flour-mixtures are then combined, and the whole is boiled gently. This differs from the original Liebig soup in having less milk and more malt-extract.

Schreiber and Waldvogel⁴ state that the addition of **albumose** to cows' milk causes the casein to precipitate in fine flocculi, which are more easily digested in a child's stomach than the ordinary curd; the use of an inexpensive albumose prepared from casein is recommended, and formulas are given for the preparation of milk-mixtures at the different ages.

A. Keller⁵ found that the addition of **carbohydrates** to the diet made the absorption of nitrogen less than when milk alone was given; but it caused a much larger percentage of nitrogen to be retained.

A. Kolisko⁶ describes the preparation of **Backhaus's kindermilch**, and reports on its use in 20 cases, 6 of which were under observation for 2 or 3 weeks only, the remainder being seen for several months. All were dyspeptics and much below weight; 10 of the 14 gained steadily, and were completely restored to health; 3 improved, but not rapidly; and 1 died in 6 days from enteritis. While the author does not consider it a perfect substitute for breast-milk, yet he recommends it highly for sick children. In the preparation of the kindermilch, the milk is taken from a carefully selected herd, under strict cleanliness, and

¹ Loc. cit.

³ Deutsch. med. Woch., No. 39, 1898.

⁵ Centralbl. f. innere Med., Jan. 14, 1899.

⁶ Arch. f. Kinderh., Band 26, Hefte 5 u. 6.

² Ibid.

⁴ Ibid., Aug. 11, 1898.

the cream then separated by centrifugation ; the skimmed milk is then mixed with rennet, trypsin, and sodium carbonate, and kept at a temperature of 40° C. for half an hour, the trypsin having by this time converted 30% of the casein into a soluble form of albumin, the rest of the casein being precipitated by the rennet. Steam is then introduced, and the temperature raised to 80° C. for 5 minutes. The mixture is then strained through cloths, and addition is made of $\frac{1}{3}$ the volume of water, $\frac{1}{4}$ the volume of cream, and the necessary amount of milk-sugar ; it is then divided into bottles containing 125 cc. (4 oz.), and sterilized and sealed ; 2 other strengths are prepared by using different proportions of cream and water ; the percentages in the 3 preparations are as follows :

	I.	II.	III.
Fat	3.1	3.2	3.3
Milk-sugar	6.0	5.4	4.8
Casein	0.6	1.8	3.0
Albumin	1.0	0.3	0.5
Salts	0.4	0.4	0.7

It will be seen that the percentages of the first approximate very closely those of human milk.

T. Escherich¹ mentions the importance of the probability that the **lactic-acid fermentation** in milk and the lactic acid contained in it have a markedly anti-septic action ; and insists, on the other hand, that it is not sufficiently recognized that the disinfecting power of the gastric juice is of little value in infants, especially those fed artificially, because of the large amount of free HCl, with which cows' milk combines.

R. G. Freeman² calls attention again to the objections to the use of sterilized milk, and also to the necessity of some sort of **sterilization**, urging pasteurization at 68° C. (155° F.) for 30 minutes as being sufficient to destroy pathogenic germs without changing the taste of the milk or causing chemie alterations.

R. O. Beard³ outlines the physiologic principles underlying **infant dietary**. After discussing the elements which often render the mother's milk an unsuitable food, he mentions, as the 3 primary factors in artificial feeding : 1. A proper quality of the food. 2. The proper quantity at each feeding. 3. The interval of time between feedings. The aim to produce a food proper in quality is along 1 of 3 lines : (a) Modification of cows' milk, which the author prefers ; (b) predigestion of cows' milk ; (c) manufactured foods, the ordinary use of which the author thinks is a professional scandal. For the proper quantity, the author gives the following table of the gastric capacity of infants, and thinks that overfeeding is a cause not so much of gastric dilatation as of lack of muscular tone :

Period.	Quantity.
One week	70 cc.
One month	95 "
Two months	140 "
Three "	170 "
Five "	215 "
Seven "	265 "
Nine "	300 "

¹ Deutsch. med. Woch., Oct. 6, 1898.

² Arch. of Pediatrics, July, 1898.

³ Jour. Am. Med. Assoc., Dec. 17, 1898.

He has found that infants fed on human or modified cows' milk only 3 to 5 times in the 24 hours gained in weight and height "far in excess of the average."

In addition to those mentioned in the YEAR-BOOK for 1899, methods for the **home-modification of milk** are suggested by H. M. Shriner¹ and by J. L. Morse.² While they are fundamentally the same, that given by Morse has the merit of being somewhat simpler and more easily remembered. The calculations are based on the average percentages found in the upper and lower quarters of milk that has stood for 6 hours, which are:

	Fat.	Sugar.	Proteids.
Upper quarter	10.00	4.50	4.00
Lower "	0.25	4.50	4.00

To obtain a certain percentage of fat—amount of upper one-quarter wanted: total 24 hours' amount = % of fat wanted: % of fat in upper one-quarter. In calculating the percentages of sugar and proteid, account must be taken of the percentages of these substances in the cream used: this is done by the following (similar) proportion: % of sugar and proteids obtained: % of sugar and proteids in upper one-quarter = ounces of upper one-quarter used: total amount in ounces. As the percentage of sugar desired will be much higher than that thus obtained, the deficiency may be made good by the addition of milk-sugar, the amount required being easily estimated. If a higher proteid is desired, skimmed milk, or the lower quarter, may be used, the calculation being similar to that for the fat, the terms being—amount of lower one-quarter wanted: total 24 hours' amount = % of proteids wanted: % of proteids in lower one-quarter. The author, in urging the use of modified milk, shows that the necessary apparatus need not be expensive, nor the method laborious, nor the time involved long, while the results justify its use.

C. W. Townsend³ also discusses the home-modification of milk, giving a simple and easily understood scheme which he finds to work well, even in dispensary practice. It is also based on the use of the top quarter of milk that has stood for 6 hours, the percentages being: Fat, 10%; proteid, 4%; sugar, 4%. The rule to be remembered is this: Each ounce of 10-% cream in a 20-oz. mixture represents 0.50 % of fat, 0.20 % of albuminoids, and 0.20 % of sugar; and each even tablespoonful of sugar of milk represents 2%. In a mixture containing 4 % of fat, the highest proteid obtainable is 1.60 %; the proteid may then be raised by taking more of the milk than the top quarter, or by adding whole milk (which contains fat), or the bottom quarter, which is nearly free from fat. The author thinks that the gravity method of obtaining cream is responsible for the fact that some children thrive better on milk modified at home, even when the same percentages are aimed at, than on laboratory-milk, for which the cream is obtained by centrifugation, for in bottles of laboratory-milk fat is often seen floating on the top as an oil-globule.

W. L. Bancr,⁴ whose formulas for home-modification were given in the YEAR-BOOK for 1899, page 611, gives as reasons for the medical profession not prescribing percentage-mixtures more generally, the complex formulas by which the percentages must be worked out, and the dread of

¹ Phila. Med. Jour., May 28, 1899.

² Ann. of Gyn. and Pediat., Apr., 1899.

³ Boston M. and S. Jour., Mar. 23, 1899.

⁴ N. Y. Med. Jour., Jan. 14, 1899.

physicians, as a class, to attempt mathematical problems. He remedies the fault of his first paper (a fault common to many others) by giving an explanation of the derivation of his formulas. He looks on milk as water holding in solution or suspension 4% each of fat, proteid, and sugar; cream is simply whole milk with an extra amount of fat, the extra fat in any cream being 4% less than the total fat-content; therefore the amount of milk and of cream in a mixture determines the percentage of proteid, and the quality [in fat] determines the proportion of fat; thus, 1 part of milk and 3 parts of water give 1% of proteid; 1 part of skimmed cream (16%) and 3 parts of water give also 1% of proteid; but the former mixture will have 1% of fat, and the latter 4% of fat. The percentage-method is not fundamentally different from former methods of milk-dilution, but it enables the physician to direct the preparation of milk more intelligently and clearly than formerly. Laboratory-milk is open to the objection that in the heavier cream used the emulsion is disturbed by centrifugation, so that home-modification is in some cases preferable.

H. A. Bunker¹ makes a further report on the modification of cows' milk by the use of hydrochloric acid and boiling; the partial hydration of the casein which the procedure accomplishes seemed in some cases to be inadequate to render it easily digestible. Acting on the suggestion by R. H. Chittenden, that proteoses and peptones combine with a far larger equivalent of hydrochloric acid than the native proteid can, due to the cleavage of the large proteid molecule into a number of simpler molecules, each of which combines with a like number of HCl molecules, Bunker found that the curdling of milk, when more than 20 drops of 10-% HCl were used in the pint of water added to a quart of milk, could be avoided by adding 20 drops to half a pint of water, mixing this slowly with a quart of milk, boiling quickly, then setting aside, while another half-pint of water was prepared with 20 drops of the acid; this can then be added to the boiled milk and acid, stirred, and the mixture boiled, giving a milk palatable and with no taste of having been boiled, and containing no free HCl. Two cases are reported: one an athreptic, scorbutic infant of 11 months; the other, a fat infant of 8 months, with chronic indigestion and an inability to digest any previous preparation of milk; both children thriving wonderfully on the above modification.

E. D. Chesebro² urges the addition of 2 or 3 gr. of table-salt to each feeding of modified milk.

A. C. Cotton³ calls attention to the value of **hens' eggs in infant-feeding**, the white of egg furnishing an easily digestible form of albumin (as seen in its use in acute intestinal disorders), free from germs, and not coagulating, when strained and mixed with alkalinized milk, on pasteurization. He recommends its use in modified milk-mixtures to avoid "proteid-starvation" with the low percentages.

There has been on the market during the past year a convenient graduated vessel, the **materna**, having on the outer surface 7 panels, 1 graduated in ounces, the other 6 graduated according to the scheme on p. 264, taken from S. V. Haas's⁴ description.

J. P. C. Griffith,⁵ in describing the same, thought that it would be

¹ Brooklyn Med. Jour., Mar., 1899; YEAR-BOOK for 1898, p. 606.

² Phila. Med. Jour., June 17, 1899.

⁴ N. Y. Med. Jour., Feb. 11, 1899.

³ Jour. Am. Med. Assoc., June 3, 1899.

⁵ Phila. Med. Jour., Apr. 8, 1899.

1	2	3	4	5	6
3d-14th day. Fat, 2%; Proteids, 0.6%; Sugar, 6%.	2d-6th week. Fats, 2.5%; Proteids, 0.8%; Sugar, 6%.	6th-11th week. Fats, 3%; Proteids, 1%; Sugar, 6%.	11th wk.-5th mo. Fats, 3.5%; Proteids, 1.5%; Sugar, 7%.	5th-9th month. Fats, 4%; Proteids, 2%; Sugar, 7%.	9th-12th mo. Fats, 3.5%; Proteids, 2.5%; Sugar, 3.5%.
Milk.	Milk.	Milk.	Milk.	Milk.	Milk.
Cream.	Cream.				
Lime-water.		Cream.			
Water.	Lime-water.				
	Water.	Lime-water.	Cream.		
		Water.		Cream.	
			Lime-water.		
			Water.	Lime-water.	
				Water.	
					Cream.
					Barley-gruel
				Milk-sugar.	
Milk-sugar.	Milk-sugar.	Milk-sugar.	Milk-sugar.		
— x	— x	— x	— x	— x	Grape-sugar

improved if the ages at which the different formulas are to be given were omitted, as changes in feeding should be made under the direction of a physician, and not left to the mother.

W. B. Cheadle's¹ 6 essential conditions to be observed in the diet of infants are: 1. The food must contain the different elements in the proportions which obtain in human milk. 2. It must possess the antiscorbutic element. 3. The total quantity in 24 hours must be such as to represent the nutritive value of 1 to 3 pints of human milk. 4. It must not be purely vegetable, but must contain a large proportion of animal matter. 5. It must be in a form suited to the physiologic condition of the digestive function in infancy. 6. It must be fresh and sound, and free from all taint of sourness or decomposition.

Heath² suggests certain lines along which **municipal control of the milk-supply** can properly be exerted; and O. W. Peck³ discusses similar points in connection with the public milk-supply.

W. G. A. Bonwill⁴ criticises the **nipples** on the market as being decidedly objectionable in that they are too long, the milk being forced out by pressure of the tongue against the roof of the month, and not by the act of sucking, and they allow the milk to flow too fast. He has found that by using a short nipple, and fastening inside of this, but inverted, another nipple with a large opening, the child must then suck

¹ New Orl. M. and S. Jour., Mar., 1899.

² Tr. Med. Soc. State N. Y.; Buffalo Med. Jour., July, 1898.

³ Albany Med. Ann., Aug., 1898.

⁴ Jour. Amer. Med. Assoc., Mar. 18, 1899.

vigorously, causing the saliva to flow and mingle with the milk, which cannot then be taken too fast.

Rocchi¹ reports good results in Pasquali's clinic, in Rome, with the use of **Gartner's "fat-milk"**² in feeding not only healthy children, but also those with acute or chronic intestinal catarrh.

Keller³ suggests **saccharin** for sweetening the food of infants with gastrointestinal disorders; it has the advantage over sugars of not causing diarrhea nor increasing elimination of ammonia, which is already high in these cases, nor favoring intestinal fermentation; it does not have any direct effect, harmful or beneficial, on the intestinal conditions. It has, of course, no food-value, but is to be used only for sweetening the food.

R. W. Fisher⁴ states that a **rich whey** may be made by adding to $\frac{1}{2}$ pint of milk 1 teaspoonful of essence of pepsin, heating it to 90° F. (instead of 100° F., as ordinarily), allowing it to stand until the casein is precipitated, and then beating and straining; the whey thus obtained he finds to contain 1% of proteid, 2% of fat, and 4.5% of sugar. A mixture of 1, 4, 7, can be obtained by using 8 $\frac{1}{4}$ oz. of whey, 1 $\frac{1}{4}$ oz. of 20-% cream, $\frac{1}{2}$ oz. of lime-water, and $\frac{1}{4}$ oz. of milk-sugar; the proteid in this is, of course, more digestible than the casein.

L. Fischer⁵ gives a series of 6 formulas for "**common-sense infant-feeding**," consisting of varying proportions of cows' milk, water, and sugar, covering the first year of life, after which whole milk should be used. [In infants that have come under observation, fed on somewhat similar mixtures, we have found the low percentage of fat to be a great objection.]

W. H. Wells⁶ describes the plan adopted at the Polyclinic Hospital, Philadelphia, for obtaining **modified milk** among the dispensary patients; cards are given with printed directions for the care of the child and the preparation of the milk. The contraindications to breast-feeding are discussed. A French writer⁷ gives the contraindications as follows: Tuberculosis is an absolute contraindication; with many other diseases the question is not so much the nature as the severity and degree of the affection. Anemia is a relative, the different cachexias positive, contraindications. The general condition is the guide after an operation has been performed on the mother. Local contraindications are affections and malformations of the nipples, which cannot be remedied with cocain, artificial nipples, etc. Epilepsy, chorea, psychoses, are contraindications, on account of the danger of accidents to the child. Hereditary syphilis is a positive indication for breast-nursing. The quantity and quality of the milk may prove contraindications; the milk of certain women has a purgative, toxic effect. The passage of toxic medicines and infective germs into the milk must also be borne in mind. The child should be isolated when the mother alone has a contagious disease. Nursing is permissible in localized puerperal infection; but the lacteal secretion fails in general infection.

H. de Rothschild,⁸ under the title "**Mixed feeding and artificial**

¹ Riforma med., vol. iv., p. 843; Wien. med. Woch., Mar. 18, 1899.

² YEAR-BOOK for 1897, p. 747.

³ Centralbl. f. innere Med., Aug. 6, 1898.

⁴ Denver Med. Times, Dec., 1898.

⁵ Med. Rec., Nov. 26, 1898.

⁶ Jour. Am. Med. Assoc., Oct. 29, 1898.

⁷ Jour. de Méd. de Paris, Nos. 35 and 37; Jour. Am. Med. Assoc., Dec. 10, 1898.

⁸ Bull. de l'Acad. de Méd., Nov. 22, 1898.

feeding," presents an exhaustive monograph, for which he received the gold medal of the Commission of the Hygiene of Childhood. The writer takes up systematically the subject of infant-feeding, urging the use of the scales regularly. Breast-feeding and its contraindications are discussed, the author not including in the latter menstruation. The results of chemie and bacteriologic examination of milk are given, the latter having revealed pathogenic germs, destroyed by a temperature of 75° C., and nonpathogenic germs which produce chemie changes in milk, and are destroyed only by a temperature above 100° C. A description of a model dairy follows; and then artificial feeding, alone and in conjunction with the breast, is discussed, the author being opposed to the use of diluted milk except in certain cases. The subject of sterilization is taken up, and the process is credited with rendering milk perfectly safe by destroying not only all bacteria, but any toxins they may have produced. [This last statement is hardly in accordance with the generally accepted belief.]

INFECTIOUS DISEASES.

Clement Dukes¹ gives an exceedingly interesting report on the **incubation-periods** of some of the infectious diseases, his observations being made on boys at the Rugby School, and extending over 28 years. The comparatively small number of cases in which he was able positively to define the limits of the period of incubation is, he states, due to the rapid spread of the disease in question; and as soon as an epidemic is once established all data are useless. Tables are given for each disease, showing the dates of probable infection, of the appearance of the rash, etc.; the following table summarizes the others:

An Analysis of the Periods of Incubation.

Name of disease.	Shortest period of incubation.	Longest period of incubation.	The largest number occur on the following days.	The majority of the cases arise between the following days.	Percentage referring to previous column; <i>e. g.</i> , 59% occur between the second and fourth days.
	Days.	Days.	Days.	Days.	
Scarlet fever .	1	9	Second and fourth.	Second and fourth.	10 out of 17 = 59%.
Chicken-pox .	13	19	Fifteenth.	Fourteenth and seventeenth.	24 out of 36 = 66%.
Mumps . . .	14	25	Nineteenth.	Seventeenth and twentieth.	50 out of 69 = 72.46%.
Rose-rash . .	12	22	Sixteenth.	Fourteenth and seventeenth.	31 out of 40 = 77.50%.
Measles . . .	8	14	Eleventh.	Ninth and twelfth.	18 out of 24 = 75%.

A table is also given showing the number of times epidemics were arrested by prompt isolation of the first case, there being 2 of röteln, 3 of measles, 5 of mumps, 9 of scarlet fever, and 11 of chicken-pox; röteln thus being the most highly contagious.

¹ Lancet, Apr. 29, 1899.

W. Sykes¹ observed a mild epidemic of varicella starting from 1 case, and was therefore able, with reasonableness, to determine the periods of incubation, which were: 6 days exactly, 1 case; not more than 7 days, 1 case; 11 or 12 days exactly, 1 case; 14 or 15 days exactly, 6 cases; 15 or 16 days exactly, 1 case; 19 days at least, 1 case. The author considers the factors upon which these variations depended to be the tissue-resistance of the person infected and the amount of the poison (number of microbes) received by him, the cases with the shortest periods of incubation having resulted from intimate personal contact. The age of but 1 of these patients is given, the 1 with the shortest period, who was 17 years; and the longest period, 19 days, was in an older brother, age not stated; the other patients were children attending a kindergarten, and their periods of incubation were about the length set down by Clement Dukes,² which, as seen by his table,³ ranged from 13 to 15 days.

Diphtheria.—A. Newsholme⁴ has written a valuable monograph on “**Epidemic Diphtheria, a Research on the Origin and Spread of the Disease, from an International Standpoint.**” An immense mass of statistics was compiled from all parts of the world, and these have been carefully digested and arranged in charts, which are constructed in a most excellent and original way. Space fails to give an analysis or extended description of the statistics; but certain interesting facts, which follow, are brought out. America seems to have more endemic diphtheria, with a greater fatality (which increases in the epidemics), than does England; thus, the lowest death-rate (diphtheria and croup combined) in Massachusetts is nearly double England’s highest death-rate. The statistics for the districts of London show that while the disease is evidently spread by personal infection, yet this is far more potent at some periods than at others in producing epidemics. The statistics of every country indicate that diphtheria is more an urban than a rural disease, as shown, for example, by London, which has more diphtheria than all the rest of England. It is also shown that the disease is continental rather than insular, and exhibits a tendency to epidemicity with intervals of great irregularity, those cities showing it in the most striking degree in which endemic diphtheria is less prevalent. The author, while believing in the efficacy of the antitoxin, also believes that the lessening of the mortality, as in Paris, is due in part to the ebb of the tide of epidemic prevalence. The large cities of Europe and America seem to be favorite endemic foci of the disease; but it does not flourish in the tropics. The influence of schools in favoring the development of epidemics the author admits; but he does not consider schools as wholly responsible, the figures for Berlin and Hamburg showing that the enforcement of regular school attendance was contemporaneous with a decline in the prevalence of diphtheria. In discussing the conditions determining the pandemics of diphtheria, the author finds that, in addition to the increase of a susceptible population, certain meteorologic and telluric conditions are evidently responsible factors. In studying the rainfall and level of ground-water, the author antagonizes the prevailing idea in the profession, and emphatically affirms that “diphtheria only becomes epidemic in years in which the rainfall is deficient, and the epidemics are on the largest scale when 3 or more

¹ Brit. Med. Jour., Jan. 14, 1899.

² Loc. cit.

³ Supra.

⁴ Swan, Sonnenschien & Co., Ltd., London, 1898, p. 196.

years of deficient rainfall immediately follow each other. Occasionally, dry years are unassociated with epidemic diphtheria; though usually in these instances there is evidence of some rise in the curve of the diphtheritic death-rate. Conversely, diphtheria is nearly always at a very low ebb during years of excessive rainfall; and is only epidemic during such years when the disease in the immediately preceding dry years has obtained a firm hold of the community, and continues to spread, presumably by personal infection." It is seen, then, that a low level of ground-water favors the development of epidemics; and the author's hypothesis is that the diphtheria-bacillus is a facultative saprophyte, living in a warm, dry soil, and leaving it in the autumn and early winter, and at the termination of a dry spell, to become again a parasite. The monograph closes with some explanatory remarks, chief of which is that exceptions to any conclusion do not disprove it; further, that the inferences need not cause a sense of comparative helplessness and lead to fatalistic inertia in attempting to control the spread of diphtheria; the spread of diphtheria still remains dependent upon personal infection; but because this is more potent at one time than at another, efforts in epidemic years should be redoubled to prevent personal infection.

R. L. Pitfield¹ reports an epidemic of 17 scattered cases in Germantown, Philadelphia, the only common condition being the **milk-supply**. Investigation of the dairy showed a most unhygienic construction, drainage from privies percolating under the stable, which was built in a little dale. Three weeks before the inspection a case of malignant diphtheria had existed in a house close by, all the slops being thrown into a privy, which overflowed and ran down into the fodder-bin and stables.

H. Richardière and L. Tollemer² were able to find diphtheria-bacilli in the **air** of the diphtheria-pavilion of the Trousseau Hospital before disinfection, the ward having been occupied for several weeks by about 15 cases; after disinfection the germs could not be obtained, the importance of frequent disinfection and cleansing being thus emphasized. They also report³ on the presence of the pseudodiphtheria-bacillus in a surprising number of healthy individuals, 18 out of 22 harboring the germ; 16 of the 22 frequented daily the diphtheria-ward, and 13 had the pseudo-bacilli in the nasal secretions; the methods of distinguishing it from the true diphtheria-bacillus are detailed, the procedure of last resort being inoculation of cultures into guineapigs previously immunized with diphtheria-antitoxin, a local reaction occurring only if the germs are the pseudodiphtheria-bacilli. Grenet and Lesné⁴ found, in 12 cases of purulent, nonmembranous coryza, bacilli answering to the morphologic, cultural, and virulent properties of the Klebs-Löffler bacillus; from a clinical standpoint, while not necessarily urging the use of antitoxin, the authors nevertheless insist on the importance of isolation and disinfection.

Mollard and Regaud⁵ record the changes which occurred in the hearts of dogs, rabbits, and guineapigs following injections of fatal doses of the **diphtheria-toxin**. The changes are the same as those found in human diphtheria, there being no true myocarditis, but a degeneration starting in the muscle-fiber, sometimes limited to it and sometimes spreading to

¹ Univ. Med. Mag., vol. xi., No. 11.

² Gaz. des Mal. Enfant, No. 10, 1899.

³ Presse méd., No. 25, 1899.

⁴ Arch. de Méd. des Enfants, No. 8, 1898.

⁵ Ann. de l'Institut. Pasteur; Arch. of Pediatrics, July, 1898.

the bloodvessels, ranging from a clouding of the normal striation to complete destruction of nucleus and protoplasm. The connective tissue is uninvolved, except for nodular areas of leukocytes, whose purpose is, as phagocytes, to remove the muscular debris.

W. P. Munn¹ gives, from the standpoint of a health officer, thorough discussion of the **preventive treatment of diphtheria**, and details the methods used in Denver. Tables are given showing that while the case-incidence declined in the last 12 years from 394 to 288, the number of deaths in the same time has fallen from 143 to 34 per year.

F. E. Batten² examined 6 cases of **diphtherial paralysis** by Marchi's method, and concludes that the dominant lesion is a parenchymatous degeneration of the myelin-sheath of the nerves, affecting both motor and sensory fibers.

J. Bruno³ has studied the subject of the **agglutination of the diphtheria-bacillus** by the serums of diphtheria patients. The previous literature on the subject is comprised in the names of Bensaude, Nicolas, and Nicolle, whose results were negative or contradictory. The author tested the serums of 44 patients and 12 healthy persons, and concluded that agglutination, although present in some cases, especially those injected with antitoxin, is not constant for all diphtheria-cultures and -serums, the serum-diagnosis being, therefore, impossible, and also the separation of the true from the false diphtheria-bacillus; pure, undiluted diphtheria-serum possesses *in vitro* a slight retarding action on the growth of the true and false bacilli, but does not kill them.

H. W. L. Barlow⁴ reports a case of **diphtheria** in a woman, 19 years old, from whose urine, which was dark-colored and contained albumin, blood, and casts, bacilli which resembled in growth and form the Klebs-Löffler bacillus were obtained by culture. The virulence was not tested, owing to an accident.

F. Smith,⁵ having produced in a guineapig hematuria by the subcutaneous injection of a live broth-culture of diphtheria-bacilli, was able to obtain from the urine pure cultures of the **Klebs-Löffler bacillus**. [These 2 cases, the one clinical, the other experimental, illustrate the necessity of disinfection of all the discharges in diphtheria, at least in those cases with hemorrhagic nephritis.]

T. J. Elterich⁶ reports 25 cases of **laryngeal diphtheria** treated by antitoxin and intubation, with 20 recoveries.

J. R. Johns⁷ gives a summary of investigations concerning the **diphtheria-bacillus**, the toxin and the antitoxin of diphtheria, including the diagnosis, prognosis, and treatment of the disease.

M. Lissner⁸ reviews briefly the literature of **diphtheria of the newborn**, and reports a case in an infant, 19 days old, the disease having been contracted from a sister, 7 years old. The infant's nasal passages, pharynx, and tonsils were the seats of membrane, and there was such obstruction to respiration that suckling at the breast was impossible; 800 antitoxin units were injected, recovery following in 9 days.

¹ Phila. Med. Jour., Mar. 4, 1899.

² Berlin. klin. Woch., Dec. 19, 1898.

³ Ibid., Nov. 19, 1898.

⁴ Phila. Monthly Med. Jour., Apr., 1899.

⁵ Arch. f. Kinderh., Band 36, Hefte 5 u. 6.

⁶ Pediatrics, Feb. 1, 1899.

⁷ Lancet, Dec. 3, 1898.

⁸ Arch. of Pediatrics, May, 1899.

Mery¹ discusses the **mixed infections in diphtheria** from a clinical as well as a bacteriologic standpoint. The associations considered are those of the diphtheria-bacillus with streptococci, staphylococci, albus and aureus, micrococcus Brisou, pneumococcus of Talamon-Fränkcl, colon-bacillus, Bacillus proteus, and the pneumobacillus of Friedländer. In treating these, the action of the antitoxin being somewhat interfered with and larger doses being necessary, local antiseptics increases in importance; but care should be taken not to injure the mucous membrane.

S. S. Adams² reports on the use of antitoxin for immunizing purposes in all the children admitted for a year (except some of the surgical cases) to the Children's Hospital, Washington. One hundred units were given to infants under 2 years, 250 units to children from 2 to 6 years, and 300 to 500 units to children above 6 years; 422 children were immunized, and 17, or 4.28%, contracted diphtheria subsequently, the shortest time elapsing between immunization and the attack being 11 days, in a girl 11 years old, who had received only 250 units; the longest period in these 17 cases was 5 months and 24 days, in an infant 2 years old, the immunizing dose being 250 units, and the average period was 51.1 days. The urine was examined before and after the injection, and albumin was found after it in only those cases which showed it before. Urticaria resulted in 2 cases. The author thinks that if larger doses had been used, better results would have been obtained; and that the duration of immunization depends on the number of units given.

Malaria.—F. M. Crandall³ states the peculiarities of malarial fever in those under 5 years of age to be: 1. Mildness or absence of the first and third stages. 2. Irregularity of the hour of paroxysms. 3. Constant enlargement of the spleen. 4. Tendency to nervous disturbances. The type of fever is usually intermittent; but if allowed to run on, it becomes remittent. The quotidian is the invariable type in infants, the tertian appearing after 4 years of age; the quartan being unknown in children. In treatment the author advises a calomel purge, followed by relatively large doses of quinin, 5 to 8 gr. being a safe daily amount for a child 1 year old; it is best given in solution disguised in syrup or verba santa, or in pills if the child can swallow them. In the chronic forms, small doses of quinin with arsenic or the syrup of ferric iodid are needed.

C. Moncline⁴ reports a case of malaria in a child, aged 5 years, with an **enormous spleen**, quinin failing, though administered by mouth and hypodermically; phenocoll hydrochlorate, in 8 doses daily of 1 gm. each, was followed by rapid recovery.

Pertussis.—M. Lacroix⁵ describes his method of administering anti-spasmodics (bromoform, bromid of camphor, cherry-laurel water) by **inhalation in oxygen**. The results obtained in 25 cases were a lessening in the number and intensity of the paroxysms, avoidance of complications, and toning-up of the system.

Meunier⁶ examined the blood of 30 patients with pertussis, and found a **leukocytosis** in every case, the increase being mainly in the number

¹ Rev. mens. des Mal. de l'Enfance, Nov., 1898. ² Arch. of Pediatrics, June, 1899.

³ Internat. Clin., vol. ii., 1898.

⁴ Am. Gyn. and Obst. Jour., vol. xiii., No. 5.

⁵ Thèse de Paris; N. Y. Med. Jour., vol. lxviii., No. 19.

⁶ Arch. de Méd. des Enfants, vol. i., No. 4.

of lymphocytes, which the author attributes to the extreme congestion of the tracheobronchial lymph-nodes.

Zuseh¹ found in the sputum of 25 cases a **bacillus**, the description of which corresponds to that already described by Czaplewski, Hensel,² and Koplik.³

W. Buttermilk⁴ reviews the **bacteriology** of pertussis, describing Ritter's *Diplococcus tussis convulsivæ*, which, he thinks, is what Vincenzi has described as a cocci-bacillus, and Czaplewski as a bacillus.

L. Vincenzi⁵ describes the germ observed by him in 18 cases.

H. Illoway⁶ reports 2 cases of **whooping-cough** in which the catarrhal stage was preceded for some time by a short, dry, hacking cough, which he considers to be a true and pathognomonic phenomenon of the entrance into the body of the toxic agents of the disease.

E. Schrieber⁷ reports a case of **cerebral hemorrhage**, in a girl 2 years old, occurring during a paroxysm in whooping-cough. The literature is reviewed, and 38 cases tabulated.

H. S. Oliphant⁸ finds that the local application of **formalin** to the throat has a specific action in whooping-cough, the severest cases being cured in a week; while for average cases 3 days suffice to end the disease. [The method of application and the strength of the solution used are not mentioned.]

G. A. Stephens⁹ found that when he **tickled his external auditory meatus** he produced a cough with a characteristic "whoop," and so was led to examine the ears of patients with whooping-cough, and found that there was either pain referred to the ears or a thin discharge from them. He then treated a number of cases by applying to the tympanum an antiseptic and anesthetic solution of cocaine hydrochlorate, 23 gr.; glycerin, 4 drams; solution of mercury perchlorid, 20 minims, and water to 1 ounce, with the result that the whoop ceased entirely in 6 days at the latest. [While we must confess ourselves rather skeptical on this matter, we mention it partly because of the novelty of the suggestion and partly to call attention to the need for frequent thorough examination of children with a chronic infection like pertussis, in which the temptation is great to be satisfied with merely prescribing one "specific" after another, in frantic attempts to lessen the number of paroxysms.]

Vaccinia.—Among the contraindications to vaccination in infants¹⁰ are a *weight* under 2500 gm. ($5\frac{1}{2}$ pounds) and the presence of **eczema** on any part of the body, the latter condition predisposing to the formation of a pustular vaccinal eruption on the eczematous area.

D'Espine and Jeandin¹¹ report a case of vaccinia, with a **generalized eruption** appearing from the fifth to the eleventh day after the vaccination (Fig. 1). [We reproduce the photograph merely to show the extent of the eruption; the character of the individual lesions cannot, of course, be made out.] Two other children vaccinated with lymph from the same tube showed a normal vaccination. The authors based their diagnosis

¹ Münch. med. Woch., No. 23, 1898.

² YEAR-BOOK for 1898, p. 627.

³ YEAR-BOOK for 1898, p. 696.

⁴ Berlin. klin. Woch., Apr. 24, 1899.

⁵ Deutsch. med. Woch., Oct. 6, 1898.

⁶ Pediatrics, Jan. 15, 1899.

⁷ Arch. f. Kinderh., Band 26, Hefte 1 u. 2.

⁸ N. Y. Med. Jour., Mar. 4, 1899.

⁹ Lancet, Dec. 3, 1898.

¹⁰ Rev. mens. des Mal. de l'Enfance, July, 1899.

¹¹ Arch. f. Kinderh., Band 26, Hefte 5 u. 6.

on the following points: 1. The eruption did not have the regular course of the eruption of variola, for it appeared first on the trunk and spread irregularly over the whole body; and when the first lesions were drying on the eleventh day, new vesicles appeared, as has been noted before in generalized vaccinia. 2. The general symptoms of variola—vomiting, pains, and general malaise—were absent, and the fever never reached 39° C. 3. The history excluded all possibility of direct or indirect exposure to smallpox. 4. No subsequent case of smallpox developed in those in contact with the child, although several had not been vaccinated since



FIG. 1.—D'Espine and Jeandin's case of generalized vaccinia (Arch. f. Kinderh., 1899).

childhood. 5. Inoculation of the contents of some of the vesicles into a calf produced vaccinia, these lesions in turn furnishing good vaccine-lymph, the calf also being protected against vaccine virus known to be strong.

Scarlet Fever.—W. J. Class¹ describes a germ found by him in cultures from the epidermic scales and from the throats of scarlet-fever patients, which he feels almost convinced is the specific germ of the disease. It is a diplococcus resembling the gonococcus somewhat, but being larger and having almost the appearance of a tetrad, owing to a pale

¹ Phila. Med. Jour., May 13, 1899.

streak running transversely through each half of the organism; it takes the anilin dyes well and is decolorized by Gram's method, but not completely; the culture-medium is the ordinary glycerin-agar, to which 5% of black garden-earth, rendered sterile by interrupted heating, has been added; growth occurs at 35° C. in from 2 to 7 days, in the form of small, whitish-gray, semitransparent colonies; experiments on rabbits and guineapigs gave negative results, the animals being affected in no way.

C. K. Millard¹ investigated the frequency with which the discharge of a convalescent scarlet-fever patient from the Birmingham City Hospital was followed by the development of the disease in another member of the family, constituting a "**return case**"; 4810 cases in 2½ years were discharged, and, at varying intervals from a few days up to 6 weeks, 171 return cases were admitted. After consideration of isolation, infectivity with regard to age, sex, and season, and the condition of the infecting cases, the author discusses desquamation, which, he thinks, is not in itself the special source of infection, though it may act as fomites; and he thinks that the period of infectivity may in many cases last beyond the period of desquamation, a point which bacteriology will probably ultimately settle.

A. Woldert² reports a case of **scarlatinal nephritis** with free hemoglobin in the renal epithelium.

R. H. Kennan³ seeks to explain instances of **relapses of scarlet fever** (3 of which have come under his notice) by exposure to an atmosphere loaded with infection, such as is found in the principal hospitals, where many cases are treated; and he suggests that there should be different wards for the patients in different periods of the disease.

J. B. A. M. van den Berg⁴ reports, from Baginsky's service at the K. and K. Friedrich Children's Hospital in Berlin, on a **study of the blood** in 16 cases of scarlet fever. After general considerations of the differences in constitution and behavior of the blood of children from that of adults, and a discussion of leukocytosis in general, a table is given for each of 12 cases, showing at each examination the day of the disease, the body-temperature, the percentage of hemoglobin, the specific gravity, the number of red cells, the number of white cells, the ratio between the two, the amount and specific gravity of the urine, and general remarks. The study of the leukocytes gave the most important results, a leukocytosis being found in every case, the maximum being reached usually from the fourth to the sixth day, the condition generally lasting from 20 to 30 days; there was no distinct relationship between the number of white cells and the severity of the disease, but the lighter cases seemed to have the higher counts; nor could any connection with the extent and severity of the eruption be established; and even the disappearance of the angina was not, as some observers have found, accompanied by a fall in the number of white cells. While the leukocytosis seems to last through the course of the disease, declining toward the end, yet there seems to be no prognostic value in the disappearance of the excess. Because a marked leukocytosis was seen in 1 light case, which

¹ Brit. Med. Jour., Sept. 3, 1898.

² Phila. Med. Jour., Oct. 8, 1898.

³ Dublin Jour. Med. Sci., No. 329, 1898.

⁴ Arch. f. Kinderh., Band 25, Hefte 5 u. 6.

showed neither angina nor gland-swelling, the author believes that the leukocytosis of scarlatina is the result of a chemotactic influence exerted by the toxin of the disease, especially as the degree of temperature stood in no constant relation with the count; an infant, 3 months old, showed in the course of the disease no greater number than 10,200 leukocytes, and the inference is drawn, to be verified by further studies, that the leukocytosis of scarlet fever is absent in infants. The number of the red cells seems to be affected to a marked degree only when a nephritis sets in; the counts at the start of the scarlatina were often over 5,000,000, a slight reduction occurring later. The author attributes the increase not to a concentration of the blood, but to a stimulation of the blood-making organs. Gower's apparatus was used for estimating hemoglobin, which, the author thinks, gives a lower reading than Fleischl's, and may be responsible for the low figures, which ranged, on the average, from 55% to 65%; this seemed to bear no relation to the range of temperature. The specific gravity was found to correspond closely with the normal figures for the corresponding ages, ranging from 1052 to 1056. A differential count of the leukocytes showed the increase to be largely in the polynuclear and transitional forms.

M. Mazaud¹ examined the **urine** of scarlet-fever patients with reference to its **toxicity**, and found that in the febrile period the relative toxicity was increased; and when the urine was normal in amount the absolute toxicity was above normal. Febrile urine is a convulsant, and when it contains albumin violent peristalsis is provoked, sometimes with bloody stools. Febrile urine also sometimes causes lacerimation and salivation, the tendency to produce the latter being more marked with heat. As the temperature of the patient falls, there is a urotoxic crisis of short duration, repeated on 2 or 3 successive days; at the start of the crisis the urine is convulsant, afterward becoming narcotic and causing dyspnea; in convalescence a hypotoxicity occurs, lasting a long time; these variations in toxicity do not coincide with changes in diet.

L. Fischer,² after using **antistreptococcus-serum** in 19 cases of scarlet fever, erysipelas, including 1 case of meningitis and 1 of puerperal septicemia, and having observed no positive beneficial effect in any case, concludes that its use should not be recommended, and that its indiscriminate sale should be prohibited until its true therapeutic value is established by clinical experience.

F. Ehrlich³ claims to be the first to report a case of **stenosis of the esophagus** following scarlet fever and diphtheria. The patient was a boy, 5 years old, and the attack was of the anginose type, symptoms of obstruction coming on shortly after it.

Measles.—Slawyk⁴ speaks of the great diagnostic value of **Koplik's sign**, which he observed in all of 32 cases of measles.

H. Koplik⁵ refers again to the **eruption on the buccal mucous membrane**, and its diagnostic importance in measles [on which he does not lay too great stress, by any means]. We reproduce his illustrations (Plate 1), which show its appearance better than any description. It comes out a day or two before the eruption on the skin, and in some cases has been

¹ Rev. mens. des Mal. de l'Enfance, Sept., 1898.

² Arch. of Pediatrics, July, 1898.

⁴ Deutsch. med. Woch., No. 17, 1898.

³ Berlin. klin. Woch., Oct. 17, 1898.

⁵ Med. News, June 3, 1899.

PLATE 1.

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.



The pathognomonic sign of measles (Koplik's spots).

FIG. 1.—The discrete measles-spots on the buccal or labial mucous membrane, showing the isolated rose-red spot, with the minute bluish-white center, on the normally colored mucous membrane.

FIG. 2.—The partially diffuse eruption on the mucous membrane of the cheeks and lips; patches of pale pink interspersed among rose-red patches, the latter showing numerous pale bluish-white spots.

FIG. 3.—The appearance of the buccal or labial mucous membrane when the measles-spots completely coalesce and give a diffuse redness, with the myriads of bluish-white specks. The exanthem is at this time generally fully developed.

FIG. 4.—Aphthous stomatitis, likely to be mistaken for measles-spots. Mucous membrane normal in hue. Minute *yellow points* are surrounded by a red area. Always discrete.

(The Medical News, June 3, 1899.)

seen 3 to 5 days earlier: The diagnosis of measles in 32 cases, based on this sign, was confirmed in all by the subsequent eruption. Strong daylight is necessary to see the bluish-white center to the red spots. Ordinary manipulation does not remove them; but hard rubbing or forceps will detach them, and on examination they are found to consist of bacteria and epithelial scales. At the height of the exanthem the blue spots are exceedingly numerous; they are not to be confounded with the yellowish-white pearls often seen in healthy children.

H. Meunier¹ calls attention to his observations on the **weight in children** during the stage of incubation of measles. He found that, although in apparent health, such children on the fourth day before the invasion began to lose in weight about 50 gm. daily until, on an average, 300 gm. were lost. The author is of the opinion that this phenomenon is not peculiar to measles, but occurs in the incubation of other infectious diseases; and that its constant presence in measles will be a valuable help in isolating before the invasion children that have been exposed to measles, and so preventing them from infecting other children.

Lemoine² reports 2 cases of measles **contracted from convalecents**, in whom the onset had been 20 days previously. He thinks that the measles-virus retains its vitality longer than is usually believed, and urges the use of disinfection.

A. Koeppen³ discusses the value of the **sign described by Bolognini** in measles, consisting of a friction sensation on palpating the abdomen, due, according to Bolognini, to an eruption on the peritoneum. Koeppen has observed it in less than 50% of the cases in a large epidemic; and he has also found it in children with diarrhea, but no measles.

W. L. Carr⁴ gives tabulated **statistics** of an epidemic of measles affecting 115 children in hospitals; 62 of the cases were complicated, and 20 died.

K. Fischer⁵ reports **3 attacks** of measles in children of 1 family, the ages being 4, 8, and 1 year. At intervals of 17, 8, and 13 days there was in each patient a second rise of temperature, with a recurrence of the measles-rash. In the child 1 year old diphtheria developed shortly and terminated fatally.

P. Vergely⁶ reports a case of measles in a girl, 10 years old, a **second attack** beginning 17 days after the onset of the first. The literature is reviewed.

Rötheln.—F. Forehlheimer⁷ describes the **enanthem**, or eruption on the mucous membranes, seen in rötheln, as an eruption seen only on the uvula and soft palate, consisting of rose-red macules, arranged irregularly and not crescentically, the size of large pin-heads, very slightly elevated, and appearing contemporaneously with the exanthem, disappearing usually at the same time with it, but sometimes undergoing an involution, which may lead to pigmentation.

Pneumonia.—F. M. Crandall⁸ reports 2 cases of **prolonged pneumonia**, the first terminating fatally on the forty-third day; the second

¹ Gaz. hebdom. de Méd. et de Chir., Nov. 6, 1898.

² Rev. mens. des Mal. de l'Enfance, July, 1898. ³ Centralbl. f. innere Med., No. 26, 1898.

⁴ Arch. of Pediatrics, Jan., 1899. ⁵ Correspondenz-Bl. f. schw. Aerzte, Sept. 15, 1898.

⁶ Rev. mens. des Mal. de l'Enfance, Aug., 1898.

⁷ Arch. of Pediatrics, Oct., 1898.

⁸ Ibid., Dec., 1898.

recovering on the sixtieth day, after coughing up a piece of popcorn, which had been inspired 2 days before the illness began.

M. S. Marcy¹ discusses **bronchopneumonia** in children, urging in the treatment the use of cold, including icebags to the head and chest and cool sponging or bathing; and decrying the use of poultices.

Lemaire² reports on Ausset's use of **saline solution** injected subcutaneously in the treatment of bronchopneumonia; 11 cases were so treated, all successfully. In patients over 3 years old, 200 cc. of 0.6% salt solution were injected at one time; under 3 years, 60 cc. were injected 3 times. The good effects of the injections were seen in the rise of blood-pressure, the increased flow of urine, increased oxidation with a general stimulation of the whole organism, especially the nervous system, and a lessening of all the symptoms. Contraindications to the hypodermoclysis are great weakness of the heart, excessive obesity, renal sclerosis, and pulmonary tuberculosis, the injection tending to light up old foci of tuberculosis. To get the best results the injections should be begun early and combined with baths, stimulants, and counterirritants (except blisters).

H. D. Chapin,³ with reference to the **management of the fever** in pneumonia, thinks that it is not necessarily an accurate index of the degree of toxemia, and that its reduction is not always of vital importance. The coal-tar antipyretics should not be given; but when the fever must be brought down, the local use of cold, by means of rubber bags containing cracked ice, or compresses of cold water (70° F.), is recommended, coupled with stimulation and the application of hot bottles to the feet. The use of the tub-bath is deprecated.

L. E. Holt⁴ outlines the treatment of pneumonia in very young children, and states that the cause of death is exhaustion, some complication, or acute toxemia; the first is to be avoided by fresh air, careful nursing, and diet, with stimulation, as needed, the best stimulant being alcohol. All the complications of pneumonia in infants are fatal, except pleurisy. The toxemia is to be overcome by vigorous stimulation, the best drugs being strychnin, nitroglycerin, ammonia, alcohol, and caffeine. The best means for reducing temperature is the cold pack. H. Koplik,⁵ on the same subject of treatment, advocates the use of strychnin and digitalis, considering nitroglycerin, caffeine, and ammonia to be too transient in action; in sthenic cases baths are useful, but should not be used if they weaken the pulse. With Holt,⁶ he recommends the vaporization in the room of creosote or some other respiratory antiseptic. W. L. Carr⁷ recommends in the bronchopneumonia in measles cleansing of the nasal passages with a solution of boric acid, counterirritation to the chest, hydrotherapy for the reduction of fever, and irrigation of the colon with normal salt solution, if there is intestinal fermentation. S. Barnuch⁸ mentions the benefits of hydrotherapy, when properly applied, to be due to the dilatation of the cutaneous bloodvessels, following an initial stage of contraction, this dilatation relieving the heart and increasing excretory activity, thus favoring elimination of the toxins and reducing the fever; in addition, the ventricular contraction is strengthened by a reflex stimulation. The water of the bath should be at 95° F. when the child is first placed in

¹ Arch. of Pediatrics, Feb., 1899.

² Sem. méd., Rev. mens. des Mal. de l'Enfance, Feb., 1899.

³ Med. News, Nov. 19, 1898.

⁴ Ibid.

⁵ Ibid.

⁶ Loc. cit.

⁷ Ibid.

⁸ Ibid.

it, and then ice-water added until the temperature of the bath has fallen to 85° F., the face being bathed meanwhile with water at 75° F., and friction maintained over the whole body all the time it is immersed; this may be repeated in from 4 to 6 hours if the temperature rises above 101° F., cold packs being used in the interval if necessary.

J. Carmichael¹ gives a description of the **pathology of croupous and catarrhal pneumonias** as seen in children, the relative infrequency of croupous pneumonia in them as compared with adults, although the infection remains the same in the majority of cases, being ascribed to the difference in the anatomy of the lung in infancy from that found in maturity, the infantile lung having smaller alveoli, with thicker walls, more bloodvessels, and a connective tissue prone to proliferate. The author recognizes 4 distinct clinical types, as follows: *a.* Complete consolidation, with lobar distribution and absence of signs of bronchial catarrh; sudden onset, ending by crisis from the seventh to the tenth day, the symptoms not depending on the extent of consolidation, but on the toxemia. *b.* No sign of consolidation; bronchial catarrh of general distribution over one or both lungs, involving the smaller bronchioles (the so-called capillary bronchitis), with a fever; like the other forms of bronchopneumonia. *c.* Bronchial catarrh, with small areas of incomplete consolidation, lobar in distribution, recognized not by percussion, but by auscultation, gradual onset, irregular fever, ending by lysis in from 10 to 20 days, but sometimes by crisis. *d.* Bronchial catarrh, with larger areas of incomplete consolidation, lobar in distribution, being a mixed type of *a* and *c*, the consolidation being extensive enough to be recognized by percussion; the dulness, however, not being so absolute as in the fibrinous form.

Epidemic Cerebrospinal Meningitis.—G. Schirner² reports in detail on 9 cases of epidemic cerebrospinal meningitis recovering under the use of unguentum Credé, 30 gm. being given daily for 3 days, and 10 gm. additional at each relapse.

Netter³ calls attention to the **sign described by Kernig**, in 1882, as pathognomonic of meningitis; briefly, it is the inability, while holding the child in the sitting posture, to extend the knee so that the popliteal space will rest on the bed. Netter has found it present in 90% of meningitis cases, and in nothing else.

Typhoid Fever.—J. P. C. Griffith,⁴ in a clinical lecture, reviews the subject of **typhoid fever in children**, as compared with adults. The infection is often by means of milk; but although the custom of cooking the milk probably prevents many cases in infants, yet if this were not done the disease would still be more uncommon in children than in adults; well-authenticated cases show that it does occur under 2 years of age. The pathologic characteristics are that ulceration is not extensive, but the mesenteric glands are decidedly enlarged. The symptoms tend to differ somewhat from those in adults in the following way: The onset usually is very uncharacteristic and indefinite, but may be very abrupt, the classic picture including spots developing in 2 or 3 days; the fever is apt to be more irregular. Abortive types may occur, but the average febrile period is from 14 to 20 days; headache often is present

¹ Brit. Med. Jour., No. 1972, 1898.

² N. Y. Med. Monatschrift, vol. x., No. 11.

³ Rev. mens des Mal. de l'Enfance, Sept., 1898.

⁴ Phila. Med. Jour., Oct. 15, 1898.

at the start, but soon ceases, and children may not feel ill at all during the course; apathy is often seen, but the typhoid state is rare; the rash is perhaps more frequent than in adults, appearing in the great majority of cases; enlargement of the spleen can be detected in about 90%; drying of the tongue is not common, but vomiting is not so rare as in adults; diarrhea and constipation are about equally present; hemorrhage is very rare; relapse occurs in about the same percentage of cases as in adults; otitis and cholera follow more frequently, and nephritis less commonly, than in older persons; the prognosis is very good, one epidemic of 192 cases having given a mortality of 1%; hydrotherapy is useful, but not necessary as a routine measure, and some children do not bear the tub-bath well.

J. L. Morse and H. W. Thayer¹ used the **Widal reaction** in examining 50 cases of enteric disturbances in infants, and conclude that this test confirms the accepted belief that typhoid fever is rare in infancy; they also believe it possible that women whose blood gives a positive reaction, even though it be years after the occurrence of the disease, may in some way transmit this to their infants.

Cassotte² reports a case of typhoid fever **in an infant** 2 months old, the diagnosis being based on the positive Widal reaction and on the fact that the child came from a district where typhoid fever was epidemic; the autopsy tended to confirm the diagnosis, Peyer's patches being enlarged and ulcerated.

L. Guinon³ quotes Marfan's and Moussous's figures for the **mortality of typhoid fever** in children as being about 2%; while in the cases collected by J. L. Morse the mortality was about 7% in children over 10 years, and about 2% in those from 5 to 10 years. In the winter of 1897 and 1898 the author treated 23 patients, 4 of whom died, 2 of perforation, aged 9 and 10 years, 1 of hemorrhage, aged 8 years, and 1 of pulmonary congestion and septicemia, aged 3½ years. Of the cases which recovered, many were very severe, among the complications being myocarditis, ulcerative stomatitis, intestinal hemorrhages, recrudescences, from slight causes, of fever in convalescence, furuncles, violent delirium, with spasmodic retention of urine and abscess of the buttocks; and 1 case of the hemorrhagic nephritic type developing in the hospital in a patient with simple purpura, the roseolar eruption becoming confluent.

Tuberculosis.—G. Kuss⁴ discusses at length, in all of its points, **Baumgarten's theory** of the hereditary transmission of tuberculosis. After showing the defects of this theory, the author gives as his belief, based on anatomic and pathologic grounds, and on the fact that the tubercle-bacilli "leave their signature in the neighborhood of the port of entry," that the "immense majority" of cases of infantile tuberculosis are acquired, the entrance of the bacilli being almost always in the lungs, the next most common, but rather infrequent, seat of infection being the intestine.

Statistics from the continent of Europe and from America point so strongly to the **respiratory tract** as the avenue of entrance in children for the tubercle-bacillus, that the contradiction by the English Registrar-

¹ Boston M. and S. Jour., vol. cxxxix., No. 2.

² Jour. de Clin. et de Therap. Inf., 1898; Arch. of Pediatrics, June, 1899.

³ Rev. mens. des Mal. de l'Enfance, July, 1899.

⁴ Ibid., Jan., 1899.

General's returns has led to the belief that English cattle must be extensively tuberculous. With reference to the subject, W. A. Wills¹ thinks that many cases of **malnutrition from improper feeding** are wrongly classed as *tabes mesentericæ*; for even if it should be proved that the cattle are tuberculous, he claims that the custom of boiling the milk is almost universal among the poorer classes, as it is the only way in which they can keep it, and thus the tubercle-bacilli are destroyed.

S. G. Guthrie,² however, after analyzing 77 postmortem records in cases of **tuberculosis in children**, with reference to the distribution and origin of the disease, concludes: 1. Thoracic tuberculosis in children is more common than abdominal, in the proportion of 3 : 2. 2. *Tabes mesentericæ* as a cause of death in young children is practically unknown. 3. The preponderance of thoracic over abdominal tuberculosis is not necessarily solely due to the direct entry of bacilli into the air-passages; for in addition to this mode of infection the lungs may be affected: (a) by bacilli entering the thoracic glands through the lymphatics of the pharynx, tonsils, or esophagus above, and through the lymphatics of the intestines to the abdominal glands below; (b) by the entry of bacilli through the thoracic duct into the pulmonary circulation by way of the right heart. 4. Primary infection through the alimentary tract does not prove that food has been the sole source of evil; therefore, tuberculosis in children is not likely to be materially checked by purification of milk-supply alone. 5. The alleged increase, of late years, of tuberculous meningitis is probably due to pulmonary tuberculosis set up by severe epidemics of measles.

A. A. Kanthack and E. Sladen³ injected **milk obtained from 16 dairies** into guineapigs, the milk from 9 dairies causing tuberculosis.

G. N. Acker⁴ reports the cases of **2 colored children**, 2 and 3 years old, with pulmonary tuberculosis, death resulting from hemoptysis.

E. Ausset⁵ reports a case in **a boy, 8 years old**; a partial review of the literature is given.

H. D. Chapin⁶ contributes an account of **peculiar respiratory phenomena** observed in 3 cases of tuberculous meningitis, in which, besides the usual disturbances of shallow, irregular, and sighing respiration, there was dyspnea just before death, so marked as to seem to be the immediate cause. Autopsies were performed in 2 of the cases, and, in addition to a tuberculous leptomeningitis, the bronchial glands were enlarged and caseous. Cultures from the throat and trachea for diphtheria-bacilli were negative.

J. Comby⁷ gives the results of **211 autopsies** on children under 2 years of age, 28 (13.27%) being tuberculous, the portal of infection being in all cases through the respiratory tract; none of the infants under 3 months of age were tuberculous. In this connection it is interesting to note the case, reported by Bonnet,⁸ of a child born prematurely at the seventh month, the mother being tuberculous and dying 2 months later; the child was nursed 3 days, and then fed on sterilized milk. After 10

¹ Lancet, Jan. 7, 1899.

³ Ibid., Jan. 14, 1899.

⁵ Gaz. hebdom. de Méd. et de Chir., Mar. 16, 1899.

⁶ Arch. of Pediatrics, Feb., 1899.

² Ibid., Feb. 4, 1899.

⁴ Arch. of Pediatrics, Aug. and Oct., 1898.

⁷ Arch. de Méd. des Enfants, vol. i., No. 5.

⁸ Rev. Internat. de Méd. et de Chir., vol. ix., No. 11.

days he was removed from the mother, and he died at 3 months of age, the autopsy showing caseous tubercles in both lungs, 4 tuberculous ulcers in the lower ileum. The mesenteric glands were large and caseous, and tubercles were seen in the kidneys, spleen, and liver. The author believes this to be a case of **hereditary tuberculosis**, because of the age of the lesions and of the short time the child was in his mother's presence. [While agreeing with this conclusion, it is to be regretted that the great interest of the case could not have been still further enhanced by reports of an autopsy on the mother, with special reference to the condition of the uterus.]

D. Boviard¹ contributes **75 autopsies** in tuberculosis to the 125 already reported by Northrup from the New York Foundling Asylum. Of the 200 cases, the bronchial lymph-glands were the portal of infection in 148, the mesenteric glands in 3, the infection being intermediate in 49.

A. Napier² reports a case of recovery from what was probably **tuberculous meningitis**, the only point failing to confirm the diagnosis being an unsuccessful attempt to obtain the spinal fluid by lumbar puncture. In the discussion, J. K. Love thought that a number of points tended to confirm the diagnosis; while J. Finlayson thought that the symptoms could have been the result of typhoid fever; and J. L. Steven believed that the case was not one of tuberculous meningitis.

Moizard and Bernheim³ report a case of **general tuberculosis** in a girl of 14 years, who for some time before death presented all the symptoms of Addison's disease, the autopsy revealing tuberculous deposits in the suprarenal glands, as well as in the lungs, bronchial glands, peritoneum, liver, spleen, and kidney.

J. Friedjung⁴ reports a case of **tuberculous spondylitis and tuberculosis of the kidney** in a girl, 7 years old, an attack of scarlatinal nephritis seeming to have predisposed the kidney to the tuberculous deposit.

Ausset⁵ exhibited to a French medical society a lung from an **infant, 11 months old**, with a tuberculous cavity the size of a hen's egg at the apex.

V. Griffon⁶ reports a case of tuberculosis in an **infant, 6 months old**, whose mother was evidently not tuberculous, the autopsy on the infant disclosing a tuberculous cavity in the lower lobe of the right lung, with general miliary tuberculosis and thrombosis of the inferior vena cava, probably from secondary streptococcal infection.

R. Whitman⁷ reports a case of **Pott's disease** in a girl, 6 years old, in whom the condition had been present for 4 years, resulting in secondary pulmonary hypertrophic osteoarthropathy.

G. Jacobson⁸ makes a systematic and accurate study of **biliary tubercles** and cavities in children, including under the term biliary tubercle all tubercles of the liver stained with bile. After discussing the history of the literature, and the clinical etiology, descriptions of the gross and microscopic appearances are given, the latter section being illustrated

¹ Arch. of Pediatrics, May, 1899.

³ Arch. de Méd. des Enfants, vol. i., No. 9.

⁴ Arch. f. Kinderh., Band 25, Hefte 5 u. 6.

⁵ Rev. mens. des Mal. de l'Enfance, July, 1899.

⁷ Pediatrics, Feb. 15, 1899.

² Glasgow Med. Jour., vol. i., No. 5.

⁶ Ibid., Jan., 1899.

⁸ Rev. mens. des Mal. de l'Enfance, Oct., 1898.

by several very excellent drawings. In the section on pathogenesis, the author discusses fully the different theories as to the mode of entrance of the bacilli, whether by the lymphatics, the bile-ducts, the portal vein, or the hepatic artery, and gives as his decided opinion that the last-named route is the one, at least in the great majority of cases in infants, if not in all cases. Biliary tubercles are not a special form of tuberculosis, nor are they distributed systematically around the bile-ducts; but they are ordinary caseous tubercles which, in their evolution, have surrounded and ulcerated into bile-ducts; and they are always associated with general tuberculosis.

H. Meunier¹ makes a suggestion which promises, according to his experience, to be of great aid in the **early diagnosis** of pulmonary tuberculosis in young children who do not expectorate. His method is to secure the swallowed bronchial secretion by lavage, the time chosen being immediately after the spell of coughing which comes when the child awakens in the morning. With the same object in view, A. Papapanagiotu² obtains the sputum by depressing the base of the tongue with a spoon-handle and touching the epiglottis, thus provoking a cough, when the sputum can be caught, before being swallowed, by an applicator wrapped with cotton.

A. Monti,³ in discussing the question whether **scrofula and tuberculosis** are really parts of the same process, and whether the distinction should still be made, studies carefully the statistics of the Vienna Polyclinic, and concludes: 1. The distinction between scrofula and tuberculosis must still be maintained, but only for the first 2 stages, in which definite tuberculous changes cannot be proved. 2. Scrofula occurs in about 9% of all cases coming for treatment; scrofula occurs, though rarely, in the first year of life, but most frequently from 1 to 5 years of age, and is very often seen after this age. 3. The relative frequency of the different stages is: First stage, 10%; second stage, 68%; third stage, 22%. 4. The curability varies with the stage—in the first, 87%; in the second, 85% (according to the part involved, 80% to 91%); in the third, 60% (according to the part involved, 32% to 82%): the mortality is, for the first stage, 1%; for the second, 3%; for the third, over 8%. 5. The causes of death in scrofula are, in the first stage, tuberculosis of the internal organs, especially the lungs, or other intercurrent infections; in the second stage, tuberculosis of the lungs and intestine; in the third stage, tuberculous meningitis and amyloid degeneration of the internal organs, and in a certain number of cases chronic sepsis. The author defines the above-mentioned stages as follows: In the first stage are seen those scrofulous affections which have their basis in incomplete histologic construction of the tissues, as well as in imperfect metabolism and its consequences. Here are classed weak muscular systems, poorly developed adipose layer, a torpid and erethistic state of the skin, abnormally soft bone-formation, anemia, weak hearts, slight hypertrophies of the lymph-glands, disorders of the respiratory and alimentary tracts; these conditions can certainly not be classed as tuberculous. The second stage is made up of those scrofulous affections which

¹ Rev. mens. des Mal. de l'Enfance, Oct., 1898.

² Ann. de Méd. et Chir. Infantiles, July 15, 1899.

³ Arch. f. Kinderh., Band 26, Hefte 3 u. 4.

depend for their development on the abnormal susceptibility of the tissues to external influences, such as those inflammations of the skin, mucous membrane, and periosteum which are characterized by slowness in healing. Products of tuberculosis cannot be found in these conditions, so they must still be considered serofulous. To the third stage belong all the serofulous processes which, through the entrance of the tubercle-bacillus, lead to tuberculous products and develop into local tuberculosis; these processes comprise tuberculosis of the lymph-glands, skin, bones, and joints.

DISEASES OF THE ALIMENTARY TRACT.

Stomatitis.—A. Kissel¹ describes a new method of treatment for **ulcerative stomatitis**, which he found to work successfully in cases that had lasted for weeks under other methods of treatment, which consisted of mouth-washes of potassium permanganate, potassium chlorate, boric acid, and applications of silver nitrate. The author's method is to remove useless teeth; curet the ulcers and rub into them powdered iodoform by means of cotton; boric acid is used in solution hourly as a mouth-wash, and the iodoform rubbed in once a day; healing occurs, on an average, within 4 days.

L. Concetti² urges the use in **thrush** of a 3% to 5% solution of silver nitrate instead of the weaker strengths usually employed. After 2 or 3 applications, made every 12 hours by allowing the infant to suck a small piece of cloth moistened with the solution, the mucous membrane becomes of its normal appearance; but a daily application should be continued for a few days to prevent a relapse.

Noma.—A. Klautsch,³ in reporting a case of noma in a 2-years old boy, discusses the etiology, and, after reviewing the contributions of Ranke, Schimmelbusch, Grawitz, and others, inclines to Freymuth's view, that it is an infectious process, without, however, a specific micro-organism in all cases, some being due to cocci and some to various bacilli, among which is the diphtheria-bacillus.

Tonsillitis.—J. Eross⁴ states that **follicular tonsillitis** is not rare in the newborn, but is frequently overlooked. He has seen it the first day after birth; but it is most often seen from the third to the sixth day. The disease is not serious, breathing and swallowing are not disturbed, and fever is not high.

B. Robinson⁵ calls attention to **enlargement of the lingual tonsil** as a common cause of cough in children; expectoration, after a few days of dry cough, is white, and then yellow and thick, sometimes blood-streaked; the cough comes on especially when lying down. The best treatment is iodine and glycerin locally, medicated steam inhalations, and for obstinate cases change of air.

Gastroenteritis.—J. Fröhlich⁶ made a clinical, bacteriologic, and histologic study of the enlarged peripheral lymph-glands in infants with **chronic gastroenteritis**, and arrived at the conclusion that the en-

¹ Arch. f. Kinderh., Band 26, Hefte 1 u. 2.

² Rev. mens. des Mal. de l'Enfance, July, 1899.

³ Arch. f. Kinderh., Band 26, Hefte 3 u. 4.

⁴ Wien. med. Presse, No. 8, 1898.

⁵ N. Y. Med. Jour., Oct. 1, 1898.

⁶ Jahrb. f. Kinderh., vol. xlvii., p. 20.

largement is not due to the direct action of bacteria, but is the result of toxins elaborated in the intestine and absorbed into the circulation.

H. Koplik¹ describes a **gastrodiaphane** he has devised for use in infants; he finds it of special value in determining the degree of dilatation of the stomach and the condition of the pylorus.

J. A. Brophy² reports a case of **gastrointestinal hemorrhage** in an infant; vomiting of bright blood began 36 hours after birth, and was repeated 4 times in 11 hours, 1 bowel-movement containing a dark clot. Ice was placed on the epigastrium and hot bottles to the feet for an hour at a time, with hourly intervals, and gallic acid, brandy, and cinnamon-water were given internally; on the fourth day, breast-feeding was resumed.

J. Wolf and H. Friedjung³ studied the **gastric digestion** in a number of infants, and arrived at the following conclusions: 1. Gastric digestion in infancy seems to be of extraordinary importance for the assimilation of food; the view advanced by Tanbe and Escherich, that the stomach is only a reservoir in which the food is prepared for digestion, may perhaps be right. Epstein has thought that the action of the rennet-ferment is not a necessary preliminary for the digestion of mother's milk. 2. No definite conclusion as to the digestive activity of the stomach is as yet admissible, based on the presence or absence of the "normal" constituents of the gastric juice; nor can an examination for these furnish any guide for treatment. 3. The different disturbances of digestion in infants produce no characteristic changes in the gastric secretion or digestion which might furnish aids to diagnosis and prognosis. 4. The only definite pathologic condition is motor insufficiency, with a lactic-acid fermentation lasting beyond the normal time of digestion, and with the probable presence of volatile fatty acids.

Bauer and Deutsch⁴ have studied the **chemistry of the gastric juice** and the motility of the stomach in healthy and sick children, with the following results: 1. In healthy nurslings, in the first weeks and months of life, lactic acid is present at the start of digestion; after 6 months, free hydrochloric acid is found toward the end of digestion, as in adults; potassium iodid appears in the saliva in from 4 to 7 minutes, and in the urine in from 7 to 15 minutes; salicylic acid is found in the urine in 35 minutes. 2. In healthy children the gastric digestion is practically the same as in adults, except that the percentage of free HCl is from 0.04 to 0.12. 3. In the gastroenteritis of nurslings, the motility and absorptive power of the stomach are lessened, free HCl disappears and fatty acids—lactic, butyric, acetic—appear. 4. In respiratory affections, bronchitis, pneumonia, etc., the presence or absence of free HCl depends on the absence or presence of fever. 5. Failing compensation in heart-disease causes free HCl to disappear, but does not affect motility nor absorption. 6. Convulsions are followed by a temporary absence of free HCl; other nervous diseases have no effect. 7. In no case of diphtheria was free HCl present, and the amount of combined acid was lessened; after ingestion of antitoxin free HCl reappeared in the majority of cases within 24 to 48 hours; and when it did not reappear the amount of combined acid was greatly increased; the later in the disease that the

¹ N. Y. Med. Jour., May 6, 1899.

³ Arch. f. Kinderh., Band 25, Hefte 3 u. 4.

² Phila. Med. Jour., Apr. 15, 1899.

⁴ Jahrb. f. Kinderh., vol. xlviii.

injection was made, the slower appeared the HCl; in the fatal cases injected, free HCl did not appear at all, which may be of prognostic value; the cases treated without antitoxin did not show free HCl until convalescent; the motility was in proportion to the acid; the absorption remained normal; in measles there is diminution of motility and amount of HCl during the fever, the absorption being unchanged; in scarlet fever free HCl is usually absent until after 6 or 7 days of apyrexia; but in some cases it was present at the start of the fever, absorption being augmented a little and motility being normal.

H. B. Whitney,¹ in reporting a case of **cyclic vomiting** in a boy, 8½ years old, who was subject to attacks with marked regularity, discusses the condition, and thinks that treatment in the interval should not include too restricted a diet, which should consist of farinaceous foods, milk, eggs, and fruit in abundance, and meat in moderation.

E. E. Graham² reports a case of **ileocolitis** in a girl, 6 years old, simulating intussusception in the passage of about 20 stools daily, consisting of bloody mucus, and in the presence of vomiting, but having no tumor, no abdominal distention, no paroxysms of pain, no great prostration; gas was expelled by the bowel, and digital examination revealed a prolapse of the rectal mucous membrane a few inches above the anus.

A. H. van den Bergh, A. Czerny, and Keller³ made investigations along 3 lines with reference to **gastroenteritis in infancy**, the first studying the influence of alkalies upon the elimination of ammonia, which, as has been shown by Keller, is increased in these disorders, not only absolutely, but also with relation to the total nitrogen; this is the result either of an increase in the acids circulating in the blood, or of a disturbance of the synthesis of urea, or a combination of both; the administration of alkalies not only lessened, but in most cases put an end to the elimination of ammonia. Czerny observed that the respiratory disturbances in acid-poisoned rabbits were similar to the sometimes fatal dyspneas observed in infants with gastroenteritis whose hearts continued to beat after the respirations had ceased; and he attributes these instances to the increase of acids in the blood caused by the enteritis, no lesions being found to account for death. [In a case recently under observation crop was suspected; but cultures were negative and the larynx was perfectly normal, while the intestines showed marked signs of an enteritis of which no history had been obtained.] Czerny and Keller, in tracing up this formation of acids, found it to be the result of fat-cleavage, the lessening of fat in the milk given to such cases being followed at once by a decrease in the elimination of ammonia; while an increase in the amount of fat sent the figures for ammonia up to a point observed only in grave pathologic conditions. Whether the body's power of oxidation is below normal, or whether the amount of acid is too great for the normal power, is not determined.

B. Bendix⁴ examined the urine of infants having digestive disturbances, and **estimated** by Schloesing's method the **ammonia**, arriving at conclusions different from Keller's. When the urine was collected aseptically and examined immediately, the ammonia was found to be normal in amount; but if the urine was collected in a special apparatus,

¹ Arch. of Pediatrics, Nov., 1898.

² Jahrb. f. Kinderh., vol. xlv.

³ Ibid., Feb., 1899.

⁴ Ibid., vol. xlviii, p. 165.

and some time elapsed between the voiding and the examination, the decomposition produced by the bacteria on the walls of the receptacle caused the figures for ammonia to rise in a varying degree, depending on the length of time elapsing, the amount of ammonia ranging from 8% to 30%. The author states that increased elimination of ammonia is a defence of the system against intoxication with inorganic acids; and that if acid-intoxication exists in gastroenteritis, as Czerny and Keller claim, it can only be an intoxication with organic acids.

Hutinel¹ gives an extended description of a form of acute gastro-enteritis, which he calls **cholera sec**, seen most frequently in children or infants between 1 and 2 years, who are usually well nourished and fat, but rachitic and of a costive habit. After a period of indigestion lasting from 1 or 2 days to several weeks, and shown by loss of appetite, coated tongue, and heavy breath, the attack begins with fever, vomiting, pain in the abdomen, and diarrhea; the stools at first are fecal and very offensive, later becoming watery, mucous, and often bloody; then subsiding in number and amount, but still remaining glairy, sometimes turning green. If proper treatment is given, recovery usually ensues at this point, if not before; but if feeding with milk has been maintained, grave symptoms develop, resembling either poisoning or an affection of the nerve-centers; the bowel-movements may resemble a mild or severe dysentery, while the stomach is irritable, even to absolute intolerance, due not to a gastritis, but to intoxication. Although the stools are not numerous nor large, the patient falls into a state of collapse, with sunken eyes, pinched features, cold extremities, and feeble pulse, resembling that in choleric form enteritis. Some patients may have convulsions, with retraction of the neck, rolling of the head, delirium, or stupor, and other symptoms suggesting a meningitis; but this can, with care, be excluded. Polymorphous erythemas or petechiae also point to toxemia, and bronchopneumonia and albuminuria may occur as complications. In favorable cases recovery is very slow, the digestive powers remaining feeble for a long time and often suffering relapses. The author mentions as clinical causes constipation and overfeeding, and refers to the difficulty of settling definitely on the exciting cause; but the suggestion is made that the association, in the intestinal canal with the colon-bacillus, of streptococci, the *Bacillus mesentericus*, the *Bacillus pyocyaneus*, or other microorganisms, may produce results which neither one could effect singly. Favoring causes are, of course, the warmth of the medium, such as milk in summer, and the nitrogenous value of the food. The author concludes with the statement that the intoxication requires greater attention than the infection.

Escherich² investigated the relation of streptococci to enteritis, and found that with Weigert's stain for fibrin and a counterstain of a saturated alcoholic solution of fuchsin, he was able to distinguish between the normal bacteria of the intestine and those present in pathologic conditions; the normal colon-bacillus is stained blue, while those in diarrheas are decolorized by the iodine, and then take up the fuchsin, turning red; the red bacilli are also found in small numbers in healthy-looking stools from artificially-fed children; and, in addition, great numbers of facultative bacteria are seen, not decolorized, but appearing of a violet color.

¹ Sem. méd., No. 7, 1899.

² Jahrb. f. Kinderh., vol. xlix., p. 137.

The red and violet bacteria may not have an absolute value, but they are an indication that the conditions for the growth of normal bacteria are modified. The author has observed 15 cases, in the stools of which the majority of germs (the red bacilli being present) were violet cocci, grouped in pairs or small chains, some of 20 to 30, but more of 5 or 6 individuals resembling the pneumococcus and the Meningococcus intracellularis, and differing from the long Streptococcus pyogenes in not forming long chains in bouillon and in being of feeble virulence. Three clinical forms of streptococcus-enteritis are described, the first, with only a local irritation, being an intestinal indigestion; the second, in which, in addition to the local lesion, there is an intoxication, resembling cholera infantum with high fever; while in the third, which occurs in infants weakened by disease or malnutrition, there is an entrance of the germs into the blood, a septicemia, the symptoms, aside from those of diarrhea, being depression of pulse and temperature, with apathy; postmortem the intestinal mucosa is found greatly altered with hemorrhages, desquamation, degeneration, and round-cell infiltration. In seeking for the source of infection, the fact that all the cases were nourished on cows' milk led to an examination of this for streptococci, with positive results, even in the cases where special care was taken of the milk. Subcutaneous injection of the milk into mice killed them, the streptococci being recovered from the blood. The author considers another source of infection to be the saliva of the child, streptococci often being found in mouths; and he attributes the comparative rarity of streptococcus-enteritis to the vital resistance of the individual; but he maintains the specificity of the streptococcus, because in a time of disease it displaces the normal bacteria of the intestine, and disappears as the disease subsides; and because it is found in the mucous and serous elements of the discharges; and, finally, because it is found during life in the blood and urine, and after death in all the organs.

R. Romme,¹ in abstracting the papers of Escherich and Hutinel, refers to the researches of Marfan and Bernard² in support of the **specificity of the streptococci**. These authors, examining the intestinal mucosa immediately after the death of a healthy animal, found it to be entirely free from microbes, even as to the lumen of the glands; so they infer that the presence of germs in the intestinal wall is proof of a pathologic state.

Nobécourt³ distinguishes between the coexistence and the association of **microbes in the intestinal canal**, the former being the growth side by side of harmless or commensal bacteria, while association implies an offensive alliance against the host; such association often takes place between the colon-bacillus and streptococci, the latter seeming to act as local irritants, causing a lesion which permits the entrance of the former. Hutinel's view, that many cases of athrepsia are the result of this association, is sustained.

Spiegelberg⁴ has studied the presence, in the stools of infants with digestive troubles, of **Flügge's peptonizing bacillus**, heretofore

¹ Rev. mens. des Mal. de l'Enfance, July, 1899.

² Presse méd., 1899.

³ "Researches on the Pathogenesis of the Gastrointestinal Infections of Young Children"; Thèse de Paris, 1899; Rev. mens. des Mal. de l'Enfance, July, 1899.

⁴ Jahrb. f. Kinderh., vol. xlix., p. 199.

found in milk. It is characterized by the vitality of its spores, and by its power of converting casein, after coagulation by rennet, into soluble albumoses. The germ is found in the stools of artificially fed infants in inverse ratio to the degree of health of the digestive organs; while in certain of the graver intestinal affections it seems to be the cause. In sterilized milk kept at an elevated temperature (not kept cold), certain changes take place which cannot be seen, but which produce marked symptoms of poisoning in infants; in the intestine these peptonizing germs seem to act only as associates, favoring the growth of other and more dangerous germs.

Méry¹ reports 3 cases of "**digestive intoxication, with constipation,**" resembling Hutinel's description of dry cholera, except that obstinate constipation existed in all of the cases. [Two, at least, of the cases correspond closely to what is called by us cyclic vomiting.]

R. Fische² makes a critical review of the subject of **intestinal infection in infants**, mentioning especially the papers of Escherich, Hutinel, Spiegelberg,³ Booker, Baginsky, Lesage, Czerny, and others. The author discusses, first, the papers which treat of the colon-bacillus, streptococcus, and other germs, and gives the opinion that an etiology in which the colon-bacillus is the chief factor is entirely inadequate. Then the papers of Czerny, Brieger, and others are analyzed, which treat of chemie alterations, the objections being urged that the acids supposed to cause the acid-intoxication are not found in the urine, and that the author has not been able to obtain good results with the diet recommended by Keller, based on this theory; namely, a diet poor in albuminoids and fat, but rich in sugar and alkalies. With reference to Baginsky's studies of the histologic changes in the intestine, the author thinks "that the changes in the gastrointestinal mucosa are rarely sufficiently marked to explain in themselves the clinical picture, and that the different degrees of interstitial inflammation, follicular swelling, and ulceration ordinarily found are of secondary importance." The old classification adopted by the Vienna school, in which the different forms of gastroenteritis are grouped under dyspepsias, intestinal catarrhs, enterites, and cholera infantum, is unsatisfactory; and the same is said of Ardoin's light, pyretic, and algid forms; of Baginsky's groups of functional troubles, catarrhal enteritis and follicular inflammation; and of Booker's dyspeptic diarrhea, gastroenteritis caused by the colon-bacillus and gastroenteritis caused by streptococci, for every little while cases appear which fit in none of these groups. Order will be brought out of chaos only when the etiology of the processes is better understood, which will be worked out along the line marked by Escherich's important researches on streptococcus-enteritis. The author suggests as a working basis for classification 3 main groups: the first comprising cases resulting from pathogenic bacteria; the second, cases resulting from a modification of the biologic activity of the bacteria normally present in the intestine; the third, cases with alterations in the tissue-products. The author further states that it will be difficult to fix pure clinical pictures for each of these groups, one merging into another rapidly.

Lesage⁴ found, as a result of his study of the **epidemic of gastro-**

¹ Rev. mens. des Mal. de l'Enfance, July, 1899.

² Ibid., May, 1899.

³ Supra.

⁴ Rev. mens. des Mal. de l'Enfance, Feb., 1899.

enteritis in Paris, during August and September, 1898, that children fed on sterilized milk (which was found to be sterile bacteriologically) were affected in as great numbers as children fed on raw milk. Examination of the discharges pointed to the absence of any toxin in the intestines; and bacteriologic examination could point to no one specific infection. The author believes that the prolonged heat of the summer caused the commensal bacteria to take on virulence, and then act as the causes of the inflammation; the serum-diagnosis of these gastroenterites, which the author believed would be of great help, proved to have no value. In the discussion, Marfan stated that there were other avenues of infection than the milk, and that sterilization in summer, if the milk had been drawn a considerable length of time earlier, would not destroy toxins already formed, which could work harm to infants.

Nobécourt¹ investigated the **serum-diagnosis** of gastroenteritis, and could not find in the blood of the patient any agglutinating property toward colon-bacilli isolated from the stools.

Appendicitis.—J. P. C. Griffith² reports 2 cases of appendicitis in **children** 4 years of age, the attack in each case following indigestion, with vomiting and diarrhea; operation revealed the presence of pus, and recovery ensued.

J. A. Hutchinson³ records the case of a child, **2½ years old**, in whom operation, at which the appendix was found to be gangrenous, was followed by recovery.

E. McGuire,⁴ in reporting **9 cases in children** from 4 to 9 years of age, mentions cases in infants reported by Deeme (7 weeks), Matterstock (20 months), Fitz (20 months), Fowler (23 months). The greater prevalence in boys is seen in 101 collected cases, 72 of which were in males. The mortality is higher than in adult life. The variability of the symptoms is discussed, stress being laid on tenderness in the right iliac fossa, and on the fact that acute peritonitis in boys is very rarely due to anything but appendicitis.

Lebrun⁵ reports a case of acute general purulent peritonitis in a boy, **7 years old**, due to rupture of an appendicular abscess, laparotomy being followed by recovery.

Peritonitis.—Lorrain⁶ reports the case of a girl, **8 years old**, with a purulent peritonitis localized in the left iliac fossa, recovery ensuing after evacuation of a liter of pus, cultures from which gave, not the pneumococcus, as was expected, but a pure growth of streptococci. With reference to the source of infection, the child was taken ill a few days before the death of her mother, probably from septicemia in confinement.

Liver.—A. Kissel⁷ reports observations on 96 cases of **infectious icterus** between the ages of 1 and 13 years. There was no definite etiology; the onset, sometimes insidious, was usually abrupt and febrile, the jaundice appearing in most cases by the fourth day. The stools were clay-colored, while the urine was dark; but albuminuria was present in 3 cases only [a remarkably small proportion, according to our experi-

¹ Rev. mens. des Mal. de l'Enfance, Feb., 1899. ² Arch. of Pediatrics, Aug., 1898.

³ Montreal Med. Jour., No. 2, 1898.

⁴ Va. Med. Semi-monthly, vol. iii., No. 14.

⁵ Rev. mens. des Mal. de l'Enfance, July, 1898.

⁶ Presse méd., No. 79, p. 177.

⁷ Jahrb. f. Kinderh., vol. xlviii., p. 235.

ence]. The liver and spleen were enlarged and tender, as a rule; slowing of the pulse was noted only in 3 cases; the average duration was 3 or 4 weeks. Death occurred in 6 cases, with symptoms of cholemia.

G. T. Still¹ reports 3 cases of **biliary calculi**, 2 of the patients being under 1 year of age; jaundice was absent in all, and colic was present in only 1. The author has collected 20 published cases, 10 being in infants.

A. Audion² reports 2 cases of **hydatid cysts of the liver in children**, the characteristic thrill being felt in both cases, although in 1 cyst there were only 2 daughter-cysts; the other cyst contained many. The physical conditions necessary for the production of the thrill are, according to Forgue, a sufficient elasticity of the containing wall, the quality of the fluid, and a moderate tension.

C. P. Putnam³ gives the notes of a case of **congenital malformation of the bile-duct in an infant 4 months old**. The symptoms were those of jaundice, with the passage of white stools unchanged by calomel or podophyllin, an enlarged liver, restlessness, and indigestion when any food containing much fat was given. Operation failed to relieve; and microscopic examination of the liver postmortem showed a failure of development of the hepatic duct, with bile-retention, connective-tissue growth, with proliferation of the bile-duets, and atrophy of the liver-cells.

J. P. C. Griffith⁴ reports a case of **acute yellow atrophy in a boy of 7 years**, the diagnosis being based on the presence of intense jaundice, coma, great diminution in the size of the liver, and leucin and tyrosin in the urine. Mention is made of 5 cases in children reported in the last few years.

Haushalter⁵ exhibited the **acutely fatty and atrophic liver from a boy, 7 years old**, sick for 15 days with jaundice and developing grave nervous symptoms and purpura; cultures from the spleen gave a pure growth of staphylococci.

DISEASES OF THE CIRCULATORY SYSTEM AND BLOOD.

J. M. Taylor and F. S. Pearce⁶ examined the records of 532 cases to determine the condition of the heart and circulation in feeble-minded children, and found **arrhythmia and tachycardia** in about half the cases; bradycardia was not rare, but intermittency of action, bruits in the neck, and edema were rarely seen; in about a third of the cases the area of precordial pulsation was increased, and in many cases transient thrills could be felt.

D. B. Lees,⁷ on **rheumatic heart-disease in children**, states that the fatal result does not depend so much on endocarditis as on pericarditis, the pericardium being found healthy at autopsy in only 9 of 150 cases. In discussing the **prognosis of heart-disease**, W. Osler⁸ gave 2 factors upon which it rested, the first being the existence of peri-

¹ Brit. Med. Jour., Apr. 8, 1899.

² Rev. mens. des Mal. de l'Enfance, Dec., 1898.

³ Arch. of Pediatrics, Sept., 1898.

⁴ Ibid., May, 1899.

⁵ Rev. mens. des Mal. de l'Enfance, Sept., 1898.

⁶ Jour. Am. Med. Assoc., Nov. 5, 1898.

⁷ Brit. Med. Jour., No. 1972, 1898.

⁸ Ibid.

cardial adhesions, not the simple ones between the 2 surfaces of the pericardium, but widespread adhesions between them and the adjacent tissues of the pleura and mediastinum; the second factor was the persistent recurrence of rheumatic manifestations, each of which increases the heart-weakness, both by endocarditis and by myocarditis. Stress was laid on the diagnostic value of Rotch's sign of dulness in the first right space. A. Baginsky,¹ in discussing Lees's paper, agreed in the conclusions as to the frequency and importance of pericardial adhesions; one of the earliest symptoms of failing compensation is cardiac arrhythmia. J. Finlayson² referred to the erroneousess of the former teaching, which was that heart-disease was uncommon in children. J. L. Steven³ considered that chorea is a rheumatic manifestation; and that, apart from chorea and rheumatism, heart-disease is rarely found in children. W. Ewart⁴ discussed the signs of heart-disease, stating that dilatation in acute rheumatic fever is difficult of proof; many cases have fluid in the pericardium, as revealed by signs and symptoms, the former being the **posterior lower dull patch**, the apex-beat in its normal position and the angular shape of the dulness; the symptoms were the suddenness of the appearance of dulness, which disappeared rapidly and often returned, and the absence of dyspnea.

H. B. Whitney⁵ states that continued observations have confirmed his first opinions, expressed in 1893, as to the **precordial area in children**. Up to 5 years of age, it is practically the same as in adult life; from 8 years to beyond puberty, the right border extends $\frac{1}{2}$ in. beyond the right sternal margins, the upper border is in the second interspace, and the extreme left border is from $\frac{1}{4}$ to $\frac{1}{2}$ in. beyond the mammillary line; in the fifth, sixth, and seventh years the conditions are inconstant.

J. W. Troitsky⁶ treats of the significance of the **peculiarities** which the growing organism shows **toward certain drugs**, with especial reference to the cardiac and vasomotor tonics. Jacobi's statement, that "children bear digitalis, and cardiac stimulants generally, better than adults, and in comparatively larger doses," is given as a kind of text, the author elaborating many diagrams which show the weights of the heart at different ages, both absolutely and with relation to the body-weight; the average height of the body, and the blood-pressure at different periods. He concludes that the dose of any of the digitalis-group must be proportionate to the size of the heart, the length of the body, and the degree of blood-pressure; and inversely proportionate to the degree of increase of weight of the heart. He calculates the following doses: An infant 1 month old should receive $\frac{1}{10}$ the adult dose; from the beginning of the third to the end of the sixth month, $\frac{1}{5}$; and during the next 6 months, almost $\frac{1}{3}$ of the dose for adults. In the second year, $\frac{2}{5}$; in the third, $\frac{3}{5}$; in the fourth, fifth, sixth, seventh, tenth to the fourteenth inclusive, $\frac{7}{10}$; in the eighth, ninth, and fifteenth, $\frac{8}{10}$; in the sixteenth and seventeenth, $\frac{9}{10}$, after which time the adult dose is to be used. [There are, of course, exceptions to this good working rule, the dose for adults doing much good in some cases of failing compensation, especially at 8 and 9 years of age, when the author indicates a large dose.]

¹ Brit. Med. Jour., No. 1972, 1898.

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Jour. Am. Med. Assoc., vol. xxxi, No. 19.

⁶ Arch. f. Kinderh., Band 26, Hefte 1 u. 2.

L. D'Astros¹ reports 3 cases of **endocarditis in children**, of other than rheumatic origin. In a boy of 7 years an attack of erysipelas was complicated by a mitral valvulitis, with a persistence of the murmur in health; a similar condition developed in a boy, 6 years old, during an attack of grip. The third case resulted fatally, and was discovered at the autopsy, the child, an infant, 10 months old, dying of a staphylococcus-infection subsequent to diphtheria; cultures of the blood from the heart gave a pure growth of cocci.

E. Weil² gives a systematic and comprehensive article on the **treatment of infantile cardiopathies**, discussing the treatment of congenital and acquired lesions, and the prophylaxis of the latter, the management during compensation, and the treatment of functional troubles.

Alexejeff³ reports the case of a girl, 10 years old, in whom an **aneurysm** formed on the **abdominal aorta**, growing rapidly and causing death from hemorrhage in 8 weeks; aside from a verrucose endocarditis, there was nothing to explain the cause.

J. L. Morse,⁴ in reporting a case of anemia in a child, 10 months old, discusses the characteristics of the **blood in children**, stating that the hemoglobin, while relatively high, as compared with adults, for a few weeks after birth is, during the rest of childhood, relatively low. The number of red corpuscles is a little larger than in adults, and will average 5,000,000 per cmm.; and nucleated forms are not rare during the first weeks of life, with variations in the size and shape of the cells. The leukocytes are more numerous than in adults, averaging about 10,000; and the relative proportions of the different forms are not the same as in adults, the limits being: small mononuclear, 50% to 70%; large mononuclear, 6% to 14%; polynuclear neutrophiles, 28% to 40%; eosinophiles, 1% to 10%. Blood-changes develop more easily and are more exaggerated in infancy than in adults, the red cells showing greater alterations in size and shape and more nucleated forms, while leukocytosis develops more rapidly and to a greater degree, not conforming to the same type, increase of polynuclear neutrophiles, as in adults, but the increase being sometimes in one form and sometimes in another, the main tendency being toward lymphocytosis. As a result of these characteristics, a classification of the anemias is difficult, the author suggesting a modification of Monti's as giving a fairly satisfactory one: I. Primary—(a) pernicious, (b) leukemia. II. Secondary—(a) mild anemia, (b) mild anemia with leukocytosis, (c) severe anemia, (d) severe anemia with leukocytosis. In any of these forms the spleen may or may not be enlarged. The author thinks that von Jakseh's *anæmia infantum pseudoleukæmia* is not a well-defined clinical type nor a primary anemia, and sees no justification for the term. In the case reported, examination of the blood showed hemoglobin, 60%; red cells, 4,340,000; white cells, 31,500. The red cells showed poikilocytosis and many nucleated forms; the leukocytosis was mainly polynuclear neutrophilic, with 3.8% myelocytes. There was great splenic enlargement, lessening under treatment; and the liver and lymph-glands were also enlarged. The leukocytes were not numerous enough to call the condition leukemia, and the red cells were too numerous for a pernicious anemia; and while it corresponds rather

¹ Rev. mens. des Mal. de l'Enfance, Dec. 1898.

² Ibid., Nov. 1898.

³ Arch. f. Kinderh., Band 26, Hefte 1 u. 2.

⁴ Arch. of Pediatrics, Nov., 1898.

closely with some descriptions of anæmia infantum pseudoleukæmia, the author thinks that it is merely a severe anemia with leukocytosis, secondary to malnutrition.

R. Fischl¹ thinks that the diagnosis of the nature of an **anemia in early infancy** cannot be made from a microscopic examination of the blood because the leukocytes present such a degree of polymorphism that certain species which have a pathologic significance later are only normal at this age; while the nature of the anemia cannot be inferred, the presence of erythroblasts in considerable numbers indicate a disturbance of hematopoiesis of a gravity in proportion to the number of erythroblasts.

F. Siegert² endeavored to see how far the **examination of dried stained preparations** of the blood could supplant the estimation of the cells and hemoglobin; and found that a diminution of the red cells was always accompanied by a change in form. If the anemia is marked in addition to the poikilocytosis there are pallor of the red cells, many nucleated red cells, and mikroytes. After discussing the changes in the leukocytes, and stating that a large number of mononuclear leukocytes indicates splenic leukemia, the author urges the value, from a diagnostic standpoint, of this mode of examination.

Marfan³ treats of the anemias of infancy, especially of **pseudoleukemic splenic anemia**, and states that all anemias of infants are secondary to some infectious state, the blood-making organs usually being enlarged and there being nucleated red cells present in the blood, without the grave significance which they have in adults; 2 cases of pseudo-leukemic splenic anemia are reported, and the author thinks that the disease can follow a chronic gastroenteritis in rickets.

L. Guinon and J. Jolly⁴ report a case of **acute leukemia** in a girl, ending fatally after 2 months; the red cells were reduced to 685,000, there were from 28,000 to 80,000 leukocytes, and the hemoglobin was 20%.

E. B. Kilham and E. Mercelis⁵ make an exhaustive bacteriologic report on 2 of 10 observed cases of **hemorrhagic disease of the newborn**, finding, among other germs, a diplococcus resembling the pneumococcus somewhat; they conclude that no specific germ has yet been found associated with the disease.

G. H. Head⁶ discusses the value of the estimation of the leukocytes as an aid in the **diagnosis of diseases in children**, and lays emphasis on the great aid it furnishes, especially in typhoid fever; the low number of the leukocytes will not aid in distinguishing typhoid fever from grip, but it will help in differentiating it from appendicitis, osteomyelitis, enterocolitis, infectious diarrheas, pyemia, and septicemia. Other diseases in which the leukocyte-count is an aid are: lobar pneumonia, a high count indicating a favorable prognosis; tuberculosis, except of the lungs, having a low count; nontuberculous meningitis, leukocytosis; scarlet fever, leukocytosis; measles, no increase.

N. von Etlinger⁷ discusses **purpura hæmorrhagica in infants**,

¹ Jahrb. f. Kinderh., vol. xlix., p. 26. ² Ibid., p. 44.

³ Arch. de méd. des Enfants, No. 12, 1898.

⁴ Rev. mens. des Mal. de l'Enfance, June, 1899.

⁵ Arch. of Pediatrics, Mar., 1899.

⁶ Northwestern Lancet, vol. xix., No. 434.

⁷ Arch. f. Kinderh., Band 25, Heft 3 u. 4.

reviewing the literature and reporting in great detail the case of an infant 2 months old. L. Perrin¹ also reviews the same subject systematically. P. d'Orlandi² tabulates 20 cases of **gastrointestinal disturbances in infants**, in whom he estimated the number of blood-corpuscles, making also a differential count of the leukocytes. He found that these disorders almost invariably reduce the number of red cells; and, while they sometimes are accompanied by a hyperleukocytosis, yet frequently the white cells are diminished in number. The proportions of the different forms of leukocytes is usually disturbed, the large mononuclears and eosinophiles being reduced in number. The only conclusion the author feels justified in drawing is that the observations indicate the feeble resisting power which infants with chronic digestive troubles show toward infections and intoxications.

DISEASES OF THE URINARY SYSTEM.

H. Kreutzmann³ discusses **convulsions of the newborn**, and reports attacks occurring in an infant 36 hours after birth, with no other apparent cause than the "kidney of pregnancy" in the mother, who had had albumin and casts from the sixth month of gestation; both recovered.

C. G. Kerley⁴ reports a case of **acute nephritis**, due to malaria, in an infant 18 months old; quinin by the mouth had no effect in daily dose of 16 gr. for 4 days, so $7\frac{1}{2}$ gr. of the hydrochlorate were given subcutaneously, with a prompt cessation of the paroxysms; recovery from both the malaria and the nephritis ensued in a few days.

S. M. Hamill⁵ reports a case of **sarcoma of the kidney in a child of 5 years**, the tumor growing to an enormous size; the descending colon did not flatten out over the growth, but occupied a groove and was distended, obscuring the diagnosis.

Cases of **movable kidney** are reported by G. N. Still⁶ and by T. Fisher,⁷ the latter observing 1 postmortem in an infant 18 months old; the former having detected 1 also at an autopsy and 1 in a healthy infant.

J. H. Morgan⁸ discusses **tumors of the kidney in childhood**, and states that they are mostly sarcomas, a few being like adenomas, and nearly all being malignant; the cortex is their most common starting-point, tumors of the adrenals being very rare. Hydronephrosis, adhesions, ascites, and edema of the lower extremities may result from the presence of the tumor, which grows forward, forming a smooth, rounded surface, unlike the sharp edge of the liver or the notched surface of the spleen. The tumor is movable to a certain extent, dull, except where the intestine crosses, and may be so soft as to give a sense of fluctuation. The growth is so rapid that the tumor is often of large size when first discovered. Intermittent hematuria is said to be the primary symptom in about 12% of the cases.

L. Bernhard⁹ gives an extensive report on **embolic infarcts of the kidney**, and describes the changes that occurred in an infant 4

¹ Rev. mens. des Mal. de l'Enfance, Nov., 1898.

² Ibid., July, 1899.

⁴ Ibid., Oct., 1898.

⁶ Brit. Med. Jour., No. 1972, 1898.

⁸ Lancet, No. 3887, 1898.

³ Arch. of Pediatrics, Sept., 1898.

⁵ Univ. Med. Mag., vol. x., No. 10.

⁷ Ibid.

⁹ Arch. f. Kinderh., Band 25, Hefte 3 u. 4.

months old, the condition evidently being dependent on a mitral valvulitis caused by infection of the umbilicus at birth.

DISEASES OF THE RESPIRATORY SYSTEM.

E. M. Dupaquier¹ has found that many cases of **subacute bronchitis in children**, not yielding to the usual measures, are probably due to autointoxication from the alimentary tract, for treatment directed along this line was promptly successful.

J. D. Steele² reports a case of **pleuritis in an infant**, a few days old, following septicemia in the mother; the child was nursed but 1 day after the mother developed fever, and it seemed to remain well for a day after weaning, but then developed an acute gastroenteritis, later becoming cyanosed and dyspneic, dying on the fourteenth day. At the autopsy the left pleural sac was filled with a sanguinopurulent fluid, and there was catarrhal pneumonia in the right lower lobe. The author reviews the literature, and collects 25 cases, which he analyzes with especial reference to the portal of infection. Prenatal infection through the placenta or an external wound is rare, the more common mode being through the umbilical stump, aspiration of septic material or of air rich in germs of suppuration, or not infrequently through the mother's milk after she has become infected.

Achmetjew³ reports a case of **bilateral empyema in a 9-year's old girl**, 17 days being allowed to elapse between the drainage of the 2 sides; recovery ensued in about 4 months. W. H. Cooke⁴ reports a similar case, in a girl, 11 years old, with an equally favorable result.

A. Monssous⁵ refers to the **difficulties of diagnosis** presented by **pleural effusions in children**, and especially infants, and gives a tabulated statement of the help furnished by the coin-test, as used in pneumothorax. Fluid in the pleural cavity transmits the metallic sound clearly and much more sharply than the healthy lung or a pneumonic lung; encysted pleural effusions and tuberculous consolidations give dull sounds. Postmortem experiments were conducted with injections of fluid into the pleural cavity, the results confirming the observations on the living.

CONSTITUTIONAL DISEASES.

Scurvy.—D. Boviard⁶ collected 64 cases of **scurvy** since the paper of Northrup and Crandall, published in 1894. An analysis is given of the symptoms and previous modes of feeding, and the conclusions reached that sterilization of milk may produce scurvy, and that it may develop even in breast-fed infants.

F. Huber⁷ mentions, among the diseases for which **scurvy has been mistaken**, rheumatism, stomatitis, purpura, rickets, sarcoma, osteitis, and infantile paralysis. He records a case brought to him which had been erroneously diagnosed scurvy because of pains on handling the legs, and because of enlargements of the epiphyses of the right femur and the

¹ Phila. Med. Jour., Dec. 10, 1898.

² Phila. Med. Jour., Sept. 17, 1898.

³ Arch. f. Kinderh., Band 26, Hefte 1 u. 2.

⁴ Lancet, Oct. 1, 1898.

⁵ Rev. mens. des Mal. de l'Enfance, Jan., 1899.

⁶ Phila. Med. Jour., Aug. 20, 1898.

⁷ Phila. Med. Jour., Apr. 1, 1899.

left radius and ulna. Antiscorbutic diet did not cause improvement; and the child was found to have nasal voice, nasal catarrh, and a few indistinct macular syphilides on the hand, the condition being multiple syphilitic epiphysitis; appropriate treatment was followed by steady improvement.

Rachitis.—L. Raulin¹ contributes a suggestive article as to the way in which **improper feeding results in rachitis**. He studied the gastric digestion in healthy and in rachitic children, finding in the latter a lessening of the total acidity, of the total chlorids, and of the compound organic chlorids, and a great diminution of the coefficient of utilization, with an increase in the organic acids. In spite of this last factor, the total acidity is, nevertheless, decreased, because the chlor-organic compounds are feebler in rachitis than in healthy children; and also because there is a qualitative difference in their composition in the former, being made up, not of acid bodies, but of neutral or ammoniacal bodies, which furnish the starting-point for the phenomena of autointoxication and of cellular inanition presented by rachitis.

J. Bonniſay² brings up the question of the **head in rachitis**, as to whether it is increased in size absolutely or only relatively, and quotes Steiner and Guérin as the first who claimed that the head is only apparently, and not really, increased in size. Marfan is mentioned as one of those who at present believe this; but the lack of its general acceptance led the author to make careful measurements in many cases at different stages of rachitis, with the following conclusions: 1. In the first period of rickets, the absolute dimensions of the head are generally diminished. 2. From the age of 5 years, these same dimensions are, on the contrary, augmented. 3. In proportion to the child's height, the rachitic head is constantly larger than normal, furnishing the most striking characteristic of rickets. 4. This lack of proportion between the height and the head's volume is in relation to the "brachycephalus," which is a lack of proportion between the different dimensions of the head.

I. A. Abt³ reports the case of a **boy of 12 years**, extremely rachitic and only 3 ft. 5 in. tall. Numerous skiagrams are given of the skeleton, showing delayed union between the ossified epiphyses and the long bones, and the deformities, especially of the pelvis.

A. H. Tubby⁴ describes a **curious feature** which he has observed in cases of rickets, consisting of a pad on the dorsum of the foot quite different from the fulness seen on healthy children's feet, the skin in the former being closely attached to the subcutaneous areolar tissue; the color of the rachitic pad is yellowish, with a transparent, waxy appearance. After studying 100 rachitic children, the author concludes that a large proportion (86%) have the pad on the dorsum of the foot, a smaller number showing it on the hand, also; the consistency of the pad varies, as does its mode of origin, the thickening in the early months of rachitis (second to sixth) being subcutaneous and semifluid. If the rickets has lasted from 6 to 18 months, the pad, which is well developed, is made up of thickened subcutaneous tissue and periosteum and enlarged epiphyses; after rickets has lasted for 18 months, the subcutaneous element of the pad disappears, and leaves the bony changes apparent to the touch.

¹ Arch. clin. de Bordeaux, No. 10, 1898.

² Rev. mens. des Mal. de l'Enfance, Mar., 1899.

³ Arch. of Pediatrics, Nov., 1898.

⁴ Brit. Med. Jour., No. 1972, 1898.

O. de Coninek,¹ who attributes a causal value to the **increased elimination of lime** in rickets, which he found in 28 % of cases, has also found an increase in the amount of chlorids in the urine of rachitic children, the figures being nearly equal to the amount eliminated by adults. The lowering of nutrition and oxidation is also shown by the low figures for the sulphates and phenolsulphates eliminated.

A. Delcourt,² as a result of feeding a rabbit with a known amount of lime and lactic acid, and noting the loss in weight and the changes in the bones, concludes that it is not possible to **produce experimentally rickets** in rabbits by this method.

DISEASES OF THE NERVOUS SYSTEM.

J. K. Schmuckler³ contributes a philosophical article on **masturbation in children**, which might, with advantage, be read by parents; he is of the opinion that influences can and do work in the home as much as the school in spreading the habit.

H. Wolf⁴ reports a case of **tuberculous tumor of the cerebellum** in a girl, 7 years old, the symptoms of which were vomiting, headache, and unilateral convulsions, with subsequent impairment of motion, complete amaurosis following optic atrophy, the diagnosis being confirmed by the autopsy, which also showed a basilar meningitis and tuberculosis of the bronchial glands and lungs; 21 cases are collected from the literature and analyzed, with the following conclusions: A tubercle may exist in the cerebellum without causing any symptoms; and the duration of the disease cannot therefore be determined with certainty, because the formation of the lesion has preceded the first appearance of symptoms. In the majority of cases, the tuberculosis affects other organs as well as the cerebellum; the symptoms appear in no regular order, and furnish no definite conclusions as to localization of the lesion. The case reported seems to indicate that the cerebellum acts as a unit, its various parts not differing in function; lumbar puncture, which in the course of the case was practised 17 times, had no bad effects; but, on the contrary, gave great relief for a time from the severe headaches.

G. M. Tuttle⁵ reports a case of **pseudohypertrophic muscular paralysis** of the Landouzy-Déjérine type in a boy of 8 years, the first symptoms having become manifest after a febrile attack in the fourteenth month. Hypertrophy of the gastrocnemii and infraspinati was still visible, atrophy being very conspicuous elsewhere; the family history was negative.

A. Jacobi⁶ reports 3 cases of **amaurotic family idiocy**, and gives a brief review of the subject. He inclines to the view that the morbid anatomic changes are part of an inflammation caused possibly by a toxin. William Hirsch is quoted as suggesting that the mother of a child with the disease should not nurse any children born subsequently. W. Hirsch⁷ gives the pathologic findings in a case under observation for a year, and dying at the age of 20 months; the autopsy was made 4 hours after

¹ Rev. mens. des Mal. de l'Enfance, Sept., 1898.

² Ibid.

³ Arch. f. Kinderh., Band 25, Hefte 3 u. 4.

⁴ Ibid., Band 26, Hefte 5 u. 6.

⁵ Arch. of Pediatrics, July, 1898.

⁶ Ibid., Aug., 1898.

⁷ Boston M. and S. Jour., vol. cxxix., No. 16.

death. Serial sections were made through the cerebrospinal system, and not a single normal nerve-cell found; the cells were all greatly enlarged, the Nissl granules were dissolved into a pulverized mass, the nucleus was displaced to the periphery, the processes were few and broken. The conclusions are drawn that the disease is not an arrest of development, but is acquired, and that the widespread affection of the nerve-cells, while the neuroglia and bloodvessels remain normal, depends on some toxin having a direct action on nerve-cells.

F. Huber¹ gives the notes of a case of **progressive facial hemiatrophy** in a young girl, the condition being the result of nerve-injury from the use of forceps at birth.

F. A. Packard² reports **acute anterior poliomyelitis** occurring in a brother and sister, aged $2\frac{1}{2}$ and $1\frac{1}{2}$ years; the author believes that small epidemics like this, which are not infrequent, point to an infectious origin of the disease.

F. Schultze³ makes an interesting report on a case of **acute anterior poliomyelitis** in a boy, 5 years old, cultures from the spinal fluid obtained by lumbar puncture giving a pure growth of the Weichselbaum-Jäger *Diplococcus intracellularis meningitidis*.

C. Stamm,⁴ in reporting a case of **John Thomson's congenital laryngeal stridor**, differentiates it from laryngismus stridulus, which occurs in rachitic children at the time of dentition, and is associated with apnea, cyanosis, and general convulsions, and ending with a long-drawn inspiration. Congenital stridor begins at birth, is heard on inspiration during sleep as well as when the child is awake, persists steadily for weeks or months, and is not made worse by crying. The author does not believe it to be due to enlargement of the thymus, but thinks that it is a functional nervous disturbance.

Durante⁵ reports 2 cases of **symmetrical gangrene in newborn infants**, both having syphilitic antecedents; extensive gangrene occurred in 1, and both ended fatally; autopsy in 1 showed no special lesion.

J. L. Morse⁶ gives, as the **one essential symptom of tetany**, muscular rigidity occurring as intermittent paroxysmal contractures; the other symptoms, some or all of which are present in every case, are: Increased electrical excitability of both nerve and muscle to faradism and galvanism, with qualitative changes in the reactions to galvanism (Erb's symptom); increased mechanical excitability of both nerve and muscle (Trousseau's symptom when the large nerve trunks are compressed; and Chvostek's symptom when the facial nerve is irritated); laryngospasm; convulsions; sensory, vasomotor, and trophic disturbances; fever inconstant; unimpaired intelligence. The author thinks the term "latent tetany" applied to any of these symptoms when the intermittent muscular contractures are absent is inaccurate. The various theories with regard to etiology are discussed, and the view approved which looks on tetany as analogous to epilepsy in arising from one or more of many causes which produce poisonous substances.

C. S. Potts⁷ exhibits a case of **Friedreich's ataxia** in a girl, 15

¹ Arch. of Pediatrics, Feb., 1899.

² Jour. Nerv. and Ment. Dis., Apr., 1899.

³ Münch. med. Woch., Sept. 20, 1898.

⁴ Ibid.

⁵ Méd. Infantile, No. 7, 1898.

⁶ Jour. Am. Med. Assoc., vol. xxxi., No. 19.

⁷ Arch. of Pediatrics, May, 1899.

years old, the symptoms beginning at the age of 5; nystagmus, incoordination, choreiform movements, talipes, defective speech, and absent knee-jerks were the symptoms present; the family history was negative.

C. A. Herter¹ reports 2 cases of **hemorrhagic pachymeningitis** in infants, aged 5½ and 22 months. In discussing the diagnosis, the author states that while any combination of symptoms seen in this condition may also be seen in the course of an acute infection without any cerebral lesion whatever, yet, having given unilateral rigidity and convulsions with deepening stupor in a cachectic or rachitic child under 1 year of age, the diagnosis of internal hemorrhagic pachymeningitis becomes a probability.

A. Katz² gives the opinion that many cases reported as Friedreich's ataxia are **not hereditary**, but are instances of some other condition; and he reports the case of a girl, 8 years old, with marked restlessness of all the limbs when sitting or standing, which static ataxic movements were not increased by closing the eyes, but disappeared when the child was lying down. The gait was that of an intoxicated person, and there was incoordination of the arms without tremor; but the patient was able to write. Speech was nasal and scanning, and there was nystagmus occasionally. There was no family neuropathic tendency, and as the condition was an improvement on a condition of general helplessness, with paralysis of all the limbs, loss of speech, and inability to open the eyes following a scarlatinal cerebrospinal meningitis, the author does not consider it Friedreich's ataxia, with the added reason that the improvement is progressive.

L. J. Hammond³ states that the diagnosis of **cerebellar abscess** can be considered as established when the following symptoms are present: Present or previous suppuration in the sinuses accessory to the brain; or a history of trauma, rapid loss of flesh and strength, rapid pulse, and high temperature for the first 72 hours, followed by a decline in the temperature and an increase in the heart's action; pronounced flexure of the extremities, progressive dilatation without fixation of the pupils, half-unconscious condition with uncontrollable restlessness, a peculiar indisposition to obey requests made (as, to protrude the tongue), glycosuria, slow respirations (8 to 12 per minute), tendency, if standing, to go toward one side, swinging of the hands always toward one side, and entire absence of paralysis. The author has seen this complex of symptoms in 5 cases, the diagnosis being confirmed by operation or autopsy.

Soca⁴ reports 4 cases of **laryngismus stridulus**, with dyspnea, lasting in the different cases 6, 9, 30, and even 46 days, with recession above and below the sternum; in 1 case classical attacks of laryngismus stridulus would sometimes occur. In all the cases, adenoids, croup, and enlarged bronchial glands were excluded, and the diagnosis based on the repeated attacks, the character of the voice and cough, and the absence of false membrane.

A. S. Daniel⁵ reports 12 cases of **multiple neuritis**, 9 of which followed diphtheria, and 1 each varicella, measles, and the administration

¹ Am. Jour. Med. Sci., Aug., 1898.

² Deutsch. med. Woch., Sept. 15, 1898.

³ Arch. of Pediatrics, June, 1899.

⁴ Arch. de Méd. des Enfants, vol. i., No. 1.

⁵ Jour. Am. Med. Assoc., Nov. 19, 1898.

of arsenic in chorea. Cases of multiple neuritis in children, due to alcohol, are mentioned by G. W. Jacoby, W. M. Leszynsky, and J. Collins.¹

A. Kissel² adds to the 4 cases previously collected by him, 7 additional cases, 1 his own observation, of **hysterical anorexia in children**; and reports another case seen in a girl of 14 years, making 12 cases in all; this patient recovered after removing her from home to the hospital and isolating her from relatives.

H. B. Sheffield³ relates all of the **cases of hysteria under 15 years of age** reported in the United States; the etiology is obscure, the acquired causes, such as faulty training, alcoholism, and trauma, are of importance; boys are attacked half as frequently as girls; the symptoms are protean.

J. H. Adams⁴ suggests the use of **trional** and **sulfonal** in cases of **chorea** which do not do well under arsenic, having observed good results from their use. Luigi⁵ has used with marked success in chorea, even in cases without rheumatic symptoms, external applications of **oil of gaultheria**, used by itself or mixed with vaselin, 6 to 10 gm. of the oil being applied to the thigh and leg alternately, and covered with oiled silk to prevent evaporation.

P. S. Donnellan⁶ reports an attack of **chorea of the larynx** in a boy, 10 years old, who had never had chorea previously. The symptoms consisted of a series of short, dry coughs or barks, about 30 in a minute, due to an approximation of the vocal bands in expiration, the bark occurring only when the boy was awake, and ceasing during sleep. Recovery followed the use of arsenic. The author discusses the condition, and states that neurologists object to the term chorea of the larynx, Gowers preferring to call it habit-spasm, and C. L. Dana designating it spasmodic tic.

L. Lichtschein⁷ reports 3 cases of **prolonged chorea** (2 to 5 years) cured in from 3 to 4 weeks by massive doses of chloral (20 to 30 gr. every 2 hours), given until sleep was produced, and then reduced in dose sufficient to prolong the sleep.

MISCELLANEOUS DISEASES.

J. G. Rey⁸ found **adenoid vegetations** in each of 32 children subject to attacks of **night-terrors**, the attacks ceasing on removal of the growths; he explains the relationship by a gradual carbonic-acid intoxication resulting from the obstruction to respiration, and thinks that there is no idiopathic pavor nocturnus.

B. K. Raehford⁹ discusses **albuminuria as a lithemic manifestation** in early life, in connection with attacks of gastric neurosis or cyclic vomiting.

A. Deleourt¹⁰ reports a case of **chronic nodular articular rheumatism in a girl, 4½ years old**, who for 2½ years was helpless; death occurred from an intercurrent enteritis. At the autopsy the periarticular

¹ Phila. Med. Jour., Apr. 15, 1899.

² N. Y. Med. Jour., Sept. 24, 1898.

³ Ibid., June, 1899.

⁴ Med. Rec., Apr. 1, 1899.

⁵ Arch. of Pediatrics, Aug., 1898.

⁶ Arch. f. Kinderh., Band 25, Hefte 5 u. 6.

⁷ Arch. of Pediatrics, May, 1899.

⁸ Phila. Med. Jour., Nov. 26, 1898.

⁹ Jahrb. f. Kinderh., Band 45.

¹⁰ Rev. mens. des Mal. de l'Enfance, July, 1898.

tissues were found thickened; the articulating cartilages were intact in a few joints, but in most showed small erosions, and there was an acute osteomyelitis at the head of the left tibia. The author reviews the literature of the subject, and discusses the etiology, pathology (showing that it is distinct from tuberculosis), symptoms, diagnosis, and treatment. For the internal treatment, sodium salicylate, arsenic, tincture of iodine, colchicum, and antipyrin are recommended; for the external treatment, baths, electricity, massage, and salicylic ointments may be used.

F. E. Batten,¹ in studying the relationship between **rheumatism and chorea**, followed up 115 cases of chorea seen in hospital practice, and found that after 5 years, without rheumatism previous to the chorea, 20% developed rheumatism.

I. M. Snow² believes that some cases of **cholera infantum** are rather cases of **heat-stroke**, and reports 2 cases at 6 and 7 months, one recovering after a temperature of 107.6° F.; the other having a constantly recurring hyperpyrexia, which resulted fatally.

Firbas³ reports on 300 cases of **goiter in children**, most of whom were girls; the enlargement of the gland present at birth lessened on a milk-diet, but returned to its original size when a mixed diet was begun. Raw thyroids and tablets or powders of desiccated glands were given once or twice weekly to 27 cases, and a reduction in the size of the goiter was obtained, without any intoxication-symptoms; the raw gland gave the best results.

E. Shields⁴ reports the case of a girl developing normally until 10 months of age, when an attack of acute thyroiditis occurred, without suppuration, lasting one week, and being followed by atrophy of the gland; growth then ceased, and the child, now 7 years old, is a typical **cretin**.

J. Comby⁵ reports an interesting case of **congenital myxedema** in a female infant, 16 months old; at this age, the child was about as large as a normal child at birth, could neither walk nor talk, had coarse hair, a large tongue, and ventral hernia; constipation and subnormal temperature were also present. In spite of the administration of thyroiodin, the condition grew worse, asphyxia from spasm of the glottis necessitated tracheotomy, and death followed, the autopsy revealing complete absence of both thyroid and thymus glands.

E. Schlesinger⁶ contributes a comprehensive article on the changes in the **thymus gland in hereditary syphilis**; the lesions found are a diffuse interstitial inflammation, gumma, large hemorrhages, and the so-called abscess. The interstitial form can only be recognized microscopically, and is therefore often overlooked; the abscess is not a true abscess, but a necrotic change in the concentric bodies; 24 cases are tabulated, and references given to 9 more. The article is a valuable addition to the pathology of the thymus gland.

Gillespie⁷ of Edinburgh has used with much success in children presenting enlargement of the thyroid and tachycardia, with or without exophthalmos, 10 gr. of the iodide and 5 gr. of the bromide of strontium,

¹ Lancet, Nov. 5, 1898.

³ Jahrb. f. Kinderh., Band 41.

⁵ Arch. de Méd. des Enfants, vol. i., No. 9.

⁶ Arch. f. Kinderh., Band 26, Hefte 3 u. 4.

⁷ Rev. mens. des Mal. de l'Enfance, July, 1899.

² Arch. of Pediatrics, Oct., 1898.

⁴ N. Y. Med. Jour., Oct. 1, 1898.

3 times a day, without producing symptoms of iodism or bromism, but with a disappearance of the rapid pulse, goiter, protrusion of eyeballs, and dyspnea.

C. W. Townsend¹ reports 5 cases of **diabetes mellitus in children** under 10 years of age, all of which terminated fatally.

A. Roth² reports a case of **progressive multiple ossifying myositis** in a girl, $4\frac{1}{2}$ years old; the muscles were firmly contracted and the seat of numerous bony deposits, which had some connection with the skeleton; and their formation is attributed to increased activity of the periosteum. In 1 section only were marked changes seen in the inter-muscular connective tissue, the process, as a rule, not being a true inflammation, the term myositis, therefore, being somewhat inappropriate. The prognosis as regards life is good, the internal organs being undisturbed. Treatment has accomplished nothing; but it is suggested that a diet with a deficiency of the bone-forming salts, such as calcium, magnesium, and the phosphates, might lead to an absorption of the salts in the deposits, and so improve the condition. Morian³ reports a case in a boy, $4\frac{1}{2}$ years old, with a history of pneumonia, dropsy, measles, and traumatism; the great toes were relatively small congenitally, this curious condition having been observed in 69% of all cases of myositis ossificans examined with reference to it. A case is also reported in a boy, $6\frac{1}{2}$ years old, by R. Crawford and H. Lockwood.⁴

Lead-poisoning in a child, 4 weeks old, is reported by F. W. M. Stephenson,⁵ the origin being the accidental dusting of the neck with powdered white lead; the diagnosis was based on the etiology and the presence of a blue line on the gums, and colic.

Lancereaux⁶ reports a case of **akromegaly** in a child of 12 years; much improvement followed the administration of hypophysin.

¹ Boston M. and S. Jour., May 11, 1899.

² Münch. med. Woch., Sept. 27, 1898.

³ Ibid., Feb. 19, 1899.

⁴ Lancet, Apr. 15, 1899.

⁵ Ibid., Dec. 6, 1898.

⁶ Sem. Méd., Nov. 23, 1898.

PATHOLOGY.

BY DAVID RIESMAN, M. D.,
OF PHILADELPHIA.

BACTERIOLOGY.

TUBERCULOSIS.

The Hereditary Transmission of Tuberculosis.—G. Hauser¹ has made a careful study of the literature bearing on this question, reviewing critically: (1) The cases of tuberculosis in the newborn and in fetuses; (2) cases of tuberculosis in calves and fetal calves from tuberculous cows; (3) the studies on the occurrence of tubercle-bacilli in the testicle and semen of men, and (4) of oxen; (5) the studies on the occurrence of tubercle-bacilli in human and animal ovaries; (6) experimental tuberculosis in animal fetuses, (*a*) in cases of tuberculosis in the mother, (*b*) in cases of testicular tuberculosis of the male; (7) the experimental studies on the offspring concerning the transmission of tuberculosis. After judiciously sifting the material, he concludes as follows: 1. There is undoubtedly an hereditary transmission of tuberculosis, both in man and animals, on the part of the mother, the transmission occurring through the placental circulation. 2. Not a single indubitable case of transmission of tubercle-bacilli through the father is recorded, albeit it is demonstrated that in grave general tuberculosis bacilli are often excreted with the semen. 3. In the cases of congenital or hereditary transmitted human and animal tuberculosis, the mother suffered almost without exception from the most severe and generally fatal tuberculosis, just as up to the present bacilli have been found in the semen only in case of extensive general tuberculosis or tuberculous disease of the testicle. 4. The hereditary transmission through the mother seems, in grave general tuberculosis (miliary tuberculosis excepted), to occur only in about 10% of the offspring.

The facts just cited cannot explain the heredity of tuberculosis. The bacillary heredity exclusively through the mother is in strong contrast with the undoubted fact that a tuberculous father entails upon the offspring the same liability to tuberculosis as a tuberculous mother. Furthermore, bacillary heredity involves usually the liver and the portal lymph-glands, organs which are rarely primary seats of tuberculosis. Studies in the heredity of tuberculosis should be made on those cases in which the disease in the parents is limited; for it is well known that the descendants may suffer from severe tuberculosis when that of the parents was mild; indeed, the disease may apparently skip a generation. Hauser made a series of experiments of his own, using first rabbits, and later guinea-pigs, in which he produced a localized tuberculous lesion. Not a single

¹ Deutsch. Arch. f. klin. Med., Band 61, Hefte 3 u. 4; Univ. Med. Mag., 1898.

positive result was obtained; *i. e.*, none of the offspring of the infected animals was born tuberculous; the young animals developed naturally, as did also the second generation. From all of the foregoing, the conclusion is drawn that the theory of bacillary heredity of tuberculosis lacks all foundation, and cannot explain the family tendency to the disease, which the author admits. How is this tendency to be explained? It is due to a predisposition, a sort of idiosyncrasy, comparable to other idiosyncrasies that run in families—as those to certain drugs, to certain articles of food, etc. Tuberculosis is maintained, then, not through congenital transmission of the specific virus, but always through renewed infection with bacilli from the environment; this infection is facilitated by the existence of a specific individual susceptibility to the virus of the disease.

The Seat and the Development of Primary Pulmonary Tuberculosis.—Birch-Hirschfeld¹ presents an epoch-making contribution to the pathology of pulmonary tuberculosis. After a brief review of the historic development of the subject, he postulates his opinion regarding the primary development of the disease in the sentence: "Pulmonary tuberculosis in its first stage is, as a rule, a mucous-membrane tuberculosis located in a medium-sized apical bronchus." In proof of this theorem many data are given. The anatomy of the bronchial tree is first discussed, as the thought suggested itself that the preference of the tuberculous infection for the bronchi of the apices might be based upon anatomic grounds. Birch-Hirschfeld succeeded in making some very beautiful bronchial casts, and adopts a new scheme of classifying the bronchi, which it is not necessary to reproduce here. The primary lesions are found especially in the branches of the third to the fifth order.

The Pathologic Anatomy of Primary Bronchial Tuberculosis.—In 3067 autopsies, 41.86% presented tuberculous lung-lesions; in 11.97% the lesions were cicatrized. Of 826 cases of sudden death from acute disease or accident, tuberculous lesions were found in 171. In 105 of these the lesions were fibrous; in 31 a rather extensive pulmonary tuberculosis, and in 35 beginning tuberculous foci were found. The primary bronchial focus may readily be overlooked. It is often fairly large (the size of a hazelnut), but is situated beneath the surface. The deep situation is explained on the ground that the medium-sized bronchus is the seat of the first changes. The bronchial lesions primarily cause no change on the surface of the lung; the visceral pleura remains smooth and without adhesions. In this stage, the incipient phthisis may readily be overlooked. The discovery of these lesions succeeds best when one forms the habit of palpating the lung in all its parts before incising it. If in this way a circumscribed firm area is found, the attempt should be made to introduce the director into the afferent branch, and to incise this afterward. With this method of examination, 32 cases of beginning tuberculosis were studied. Of these, 28 were alike in having the tuberculous lesion in the wall of a medium-sized bronchus. In a few cases this was the only lesion. More frequently new tuberculous foci had formed; but these left no doubt that the bronchial focus was the primary one. As against these 28 cases of initial bronchial tuberculosis, the author found only 3 in which the primary lesions seemed to have been an interstitial

¹ *Lancet*, Oct. 1, 1898.

development of miliary tubercles. The possibility of a primary hematogenic tuberculosis must be admitted; but it is certainly rare. In view of the generally accepted doctrine concerning the beginning of pulmonary phthisis in the form of a caseous bronchial pneumonia, it is interesting to know that the author in no instance was able to demonstrate such a beginning. Numerous cases are cited proving his contention. A few words are said concerning the initial hemoptysis of pulmonary tuberculosis. It can, of course, no longer be maintained that the initial hemorrhage is the cause of phthisis (the *phthisis ab hæmoptysi* of the old writers); but its true origin has not been satisfactorily explained. Birch-Hirschfeld¹ attributes it to the rupture of venous branches in the wall of a bronchus or in the peribronchial tissue. This hemorrhage is much more benign than that occurring during the course of phthisis. That a hemorrhage may favor the extension of a tuberculous process cannot be doubted. It probably does so by carrying infectious material to parts of the lung previously healthy. But even when the hemorrhage occurs from a latent tuberculous focus in the bronchus, a favorable termination of the tuberculosis is possible. When once the tuberculous focus has broken down and communication is established with the air-passages, the opportunity for the dissemination of tuberculous material is given, and secondary tuberculous bronchopneumonias are apt to result. In this way a latent pulmonary tuberculosis is transformed into a manifest phthisis. It is a fact that even somewhat extensive apical foci may be arrested. This is generally brought about by obliteration of the affected bronchus and the fibrous transformation of the diseased area beyond. A similar favorable course may be taken by that form of primary tuberculosis having its beginning in the interstitial tissue. The residues of this form present themselves generally as anthracotic *Schwiele*n, with caseous or calcified nuclei, which frequently are subpleural, cause puckering of the surface of the lung, and bear no relation to the bronchi.

The Pathogenesis of Primary Bronchial Tuberculosis.—

Two points should be considered: the disposition of the apices to primary tuberculosis, and the perforation of the tuberculous lesion into the bronchial lumen. Regarding the seat of latent bronchial tuberculosis, Birch-Hirschfeld found that in 34 cases the right upper lobe was involved 24 times, the tuberculous focus being situated 22 times in the apical bronchus and only twice in the lower part of the upper lobe. Of 21 lesions situated high up in the lobe, 12 affected the apex itself, and 10 were situated from 5 to 7 cm. below the apex proper. It is noteworthy that both the apical and the subapical nodules seemed to prefer the posterior half of the lobe. It appears from this that the bronchial tree in the posterior part of the lung-apex constitutes a favorable soil for the deposition of inhaled tubercle-bacilli. In 15 cases the left upper lobe was affected, all the areas being situated in the apical territory of the bronchus. It is scarcely proper, from these small figures, to draw any conclusion as to whether the left or the right lobe is the more often affected, although they bear out Laennec's assertion that the right lobe is the preferential seat. More important than this point is the question why the apices are so much more frequently affected than other parts of the lung. This has been the problem since the days of Laennec and Louis.

¹ Deutsch. Arch. f. klin. Med., Band 64.

Even the earliest writers brought this predisposition of the apices in relation with the insufficient respiratory activity of the apices, the majority believing in an imperfect inspiratory action of these parts. Freund attributed this to premature ossification of the cartilages of the first rib. Rühle thought that the ordinary type of respiration (diaphragmatic) did not sufficiently bring into play the upper portions of the thorax. In pneumokoniosis, as Zenker and Arnold have shown, the apices are not more involved than the lower portions, if as much. The experiments show that inhaled dust is deposited first in the upper portions; then, however, and in the largest quantity, in the lowest parts of the lungs. After the cessation of the administration of dust, the foreign particles are removed first from the lower lobes, then from the upper. It follows from this that when there is an increased deposit of inhaled foreign particles in the apices, it is the result not of increased introduction, but of insufficient elimination. When, therefore, in some cases of pneumokoniosis the upper lobes are especially affected, it may be explained on the ground that in these cases there was an individual deficiency in the power to remove the dust. Applying this to tuberculosis, we may conclude that it is not the increased deposition of bacilli in the apices, but more likely conditions favoring their remaining that are chiefly concerned. The retention of tubercle-bacilli in these parts is connected with mechanical conditions of respiration, especially with deficient expiratory movement, as it is the expiration which is principally connected with the removal of foreign bodies from the air-passages. The apical bronchi have a nearly vertical direction, and the inspiratory and expiratory currents of air must pass in an almost opposite direction from those in the trachea. Another factor is the movement and positional changes of the bronchi during respiration. Casts made from the bronchial tree show in many instances defects and irregularities in the cross-section of apical bronchi, suggesting the existence, in these lobes which are the seats of predilection for tuberculosis, of factors interfering with the respiratory function. Several investigators, among others Riegel, have shown that in the posterior part of the apices the expiratory excursion is less than anywhere else in the lungs. The topographic conditions of the apical portion of the lung thus favor an interruption in the respiratory current of air, and the deposition of foreign bodies must, of necessity, occur where the current enters "a dead area." It is also possible that during powerful expiratory efforts with hindrance to expulsion (as in violent coughing) a retrograde current is set up, by which infectious foreign bodies are carried into the inactive part of the bronchial tubes. The defective development of the posterior apical bronchi was found frequently in cases with poorly-developed, flat chests; but it was also noted in persons of good development. It is noteworthy that in the child's lung the apical bronchi do not show the unfavorable topographic relations seen in the adult. For tuberculosis to develop in the lung, it is not only necessary that the infectious material shall lodge in the bronchi that are favorably placed, but also that it shall multiply. The conditions for this are probably produced by pathologic processes that most readily occur in those bronchi in which ventilation by the respiratory movements is deficient. In the apical bronchi secretions are easily retained, and probably serve as culture-media for the bacilli. The inflammation produced by the bacilli is like that seen in other mu-

cous membranes, and consists, primarily, in the development of subepithelial tubercles, which enlarge and break down, and in time extend to the peribronchial tissues. The liquefaction of the caseous masses leads to the formation of small bronchiectatic cavities. The experimental investigations concerning the ways in which surface infection is produced have not yielded definite results. It is probable that slight erosions of the mucosa, with imperfect regeneration of the epithelium, favor entrance of the bacilli. That the tuberculous infection demands a previous disease—in other words, that it is a secondary process—as is held by Hansemann, cannot be maintained. The intact bronchi do not offer, to be sure, a favorable seat for the entrance of tubercle-bacilli; but whatever the predisposing causes are, they are merely accessory factors, and are constituted chiefly by mechanical conditions. In those rare cases in which primary bronchial tuberculosis is found in the larger branches, special factors are probably at work. The favorable termination of incipient bronchial tuberculosis is usually brought about by obliteration of the bronchus above the lesion, with condensation, calcification, and fibroid change in the infected area beyond. The cause of the liquefaction of the tuberculous focus is not definitely established. Mechanical injuries and mixed infection may play a part. Everything should be done to prevent liquefaction. Our efforts, however, can only be successful if the diagnosis of the disease is made early enough. The demonstration of the existence of a nonliquefied primary bronchial focus is not possible by means of sputum-examination. A physical exploration may also fail. Whether the Röntgen ray will aid us, it is, as yet, too early to say.

Nicolle¹ describes the pathologic findings in a case of **verruca peruana**. This disease occurs in certain valleys of Peru, and is characterized by more or less severe constitutional symptoms, followed by the appearance on the skin or mucous surfaces of tumors (verruugas) of variable size and number. The verrugas often cause hemorrhage; they may ulcerate or be reabsorbed. The duration of the malady is variable; it may end in spontaneous recovery. Another form of this disease ends fatally from toxemia before the tumors have appeared. The specimens examined came from the latter type of the disease. The lung showed, on section, small nodules resembling tubercles, composed of epithelioid cells surrounded by embryonal cells, between which were irregularly disposed large numbers of isolated bacilli, closely simulating tubercle-bacilli, but somewhat thicker. Most of them were free; a few were contained in mononuclear phagocytes. No giant cells were present. The bacilli stained well with Ehrlich's solution, but not by any other method. There was no caseation nor true tubercle. In the liver the same bacilli were found between the cells, and typical giant cells were also present. A lymph-gland and the spleen showed complete alteration of structure, caseation was marked, and the same bacilli were found in the infiltrated areas. Attempts to grow cultures and inoculation-experiments were negative. M. Letulle has studied cutaneous verruga on the living subject, and found constantly a bacillus resembling Koch's in its form and staining-properties. The bacillus of verruga would seem, then, to be a pathogenic organism belonging to the tubercle-type, which comprises, besides Koch's bacillus, the *Bacillus aviarius*, the bacillus of tuberculosis

¹ Ann. de l'Inst. Pasteur, 1898.

of the carp, the lepra-bacillus, the pseudotubercle-bacilli of butter, and the bacilli of Bordoni-Uffreduzzi and of Czaplewski.

Dubard,¹ in an article entitled "**The Relation of Tuberculosis in Cold-blooded Animals to Tuberculosis in Animals of Constant Temperature,**" finds that the human tubercle-bacillus can be transformed into a variety which grows at the ordinary temperature. Such an organism was found in some fishes (carp) which had become infected by tuberculous sputa and dejecta emptied by a consumptive into a stream. The microorganisms grew best at a temperature of 22° – 27° C., poorly at 37° C. From the appearance of the cultures, according to the nature of the culture-medium, the age of the culture, and the rapidity of growth, this bacillus could be identified with that of man and birds. In original cultures it was not pathogenic for rabbits, man, or birds, but set up tuberculosis in cold-blooded animals of all kinds—carp, lizards, crickets, tortoises, vipers. The suppleness with which the fish tubercle-bacillus modifies its pathogenic nature according to surrounding conditions and soil was experimentally compared with the transformation effected in the tubercle-bacillus of man, if it is transplanted (under proper conditions for adaptation) into cold-blooded animals. This was effected altogether a dozen times, the animals used being carp, lizards, birds, and crickets. The expectoration and dejecta of the infected individuals were fatal in a short time to cold-blooded animals. [From being at first considered a very sensitive parasite, the tubercle-bacillus gives more and more evidence of well-marked saprophytic qualities. The importance of such qualities in the conflict with the disease can readily be realized. Against a purely parasitic germ a struggle would certainly be more hopeful.]

Infective Power of Milk from Tuberculous Cows.—Lydia Rabinowitsch and Walter Kempner² find, in opposition to other investigators, that not only in beginning tuberculosis without demonstrable lesion of the udder, but also in latent tuberculosis only demonstrable by the tuberculin-reaction, milk may contain tubercle-bacilli. If cows give the reaction to tuberculin, their milk must always be considered suspicious.

A New Method of Cultivating Tubercle-bacilli.—W. Hesse³ finds that the use of agar-agar combined with "Heyden's Nährstoff" gives in 1 to 3 days' growth a characteristic culture of the tubercle-bacillus, except in some cases where the tubercle-growth is concealed by other bacteria. The latter difficulty can be obviated by examining the cover-glasses at the end of 5 to 6 hours, when the single bacillus appears to some extent doubled in length or thickness, so that the preparations, compared with those first made, appear richer in double forms and small colonies. After a half or a whole day this appearance becomes very characteristic, especially when there are few rapidly growing bacteria. The parallel arrangement of the tubercle-bacilli becomes very marked. The culture-medium consisted of: Nährstoff Heyden, 5 gm.; sodium chlorid, 5 gm.; glycerin, 30 gm.; agar-agar, 10 gm.; normal solution of soda-erythral (28.6 : 100), 5 cc.; distilled water, 1000 cc. From personal observation, the author concludes that (1) every sputum containing tubercle-bacilli contains live bacilli capable of reproduction, which (2) can, in a relatively

¹ Rev. de Tuberculose, vol. vi., p. 129.

² Zeit. f. Hygiene u. Infect., vol. xx., p. 151, 1899.

³ Hyg. Rundschau, vol. ix.

short time, give a satisfactory culture; (3) this procedure is in many cases superior to animal inoculation.

Tubercle-bacilli in Market-butter.—Obermüller,¹ who in a previous investigation had found tubercle-bacilli in market-butter, recently examined 10 examples of Berlin butter of the best quality, purchased at different places, and found, by inoculating animals with the sediment obtained by centrifugalization, that 4 samples contained tubercle-bacilli. From the tissues of the animals that became tuberculous he was able to isolate the tubercle-bacillus in pure culture, especially by using glycerinated blood-serum, which is better for the purpose than glycerin-agar. He does not think that contaminated butter is a main factor in the spread of tuberculous infection; the exact part which it plays awaits investigation. Knowledge concerning the danger of tuberculosis through consumption of milk and milk-products should be disseminated, and the methods of prevention pointed out. Most important is governmental control of milk-cattle with respect to tuberculosis, and the use of tuberculin-inoculation.

Simon Flexner,² from the study of a case of **pseudotuberculosis hominis streptothrica**, which came to autopsy at the Johns Hopkins Hospital, in which lesions closely resembling tuberculous processes were found in the lungs and peritoneal cavity, concludes that a streptothrix differing widely morphologically from the tubercle-bacillus may be found in the lungs, causing lesions very similar to those in tuberculous pneumonias. The analogy is strengthened by the finding of tubercle-like nodules in the lungs, in which these microorganisms could be demonstrated, and of nodules in the peritoneal cavity indistinguishable from ordinary tubercles. Tubercle-bacilli were not found in the sputa. To demonstrate the presence of streptothrices in a suspicious case a modification of the Gram-Weigert stain is recommended, in which carbol-fuchsin is substituted for gentian-violet. A similar case of Buchholz's is cited.

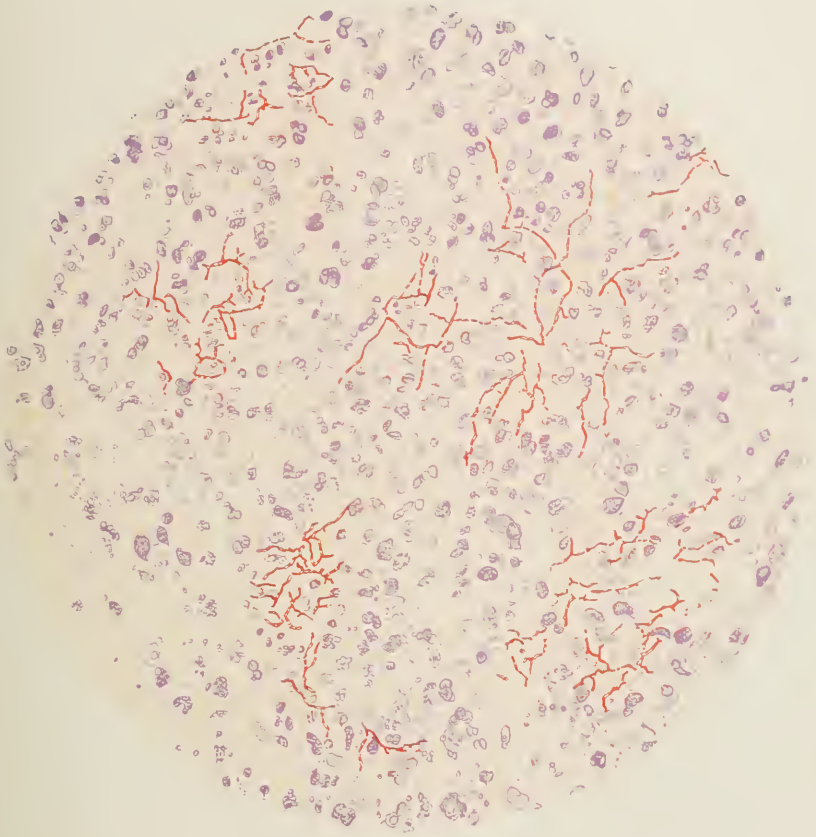
Theobald Smith,³ in a **comparative study of bovine tubercle-bacilli and of human bacilli from sputum**, offers these statements with regard to their morphology and biologic characteristics: 1. Bacilli from cattle and other animals grow less vigorously for a number of generations than the sputum-bacilli. 2. Bovine bacilli are much less influenced by modifications of the culture-medium. 3. Bovine bacilli tend to remain short; human bacilli are either more slender from the start, or become so during cultivation. With regard to their pathogenicity, experiments on tuberculosis in guineapigs, induced with cultures, show the bovine bacilli to be more virulent than human bacilli. Rabbits inoculated with bovine bacilli died in 17 to 21 days. A rapid evolution and necrosis of the pulmonary tubercles, with very great increase of the tubercle-bacilli in them, were found. In rabbits inoculated with human sputa-bacilli death did not follow, and after 1½ to 3 months they had gained on their original weight. The pulmonary tubercles in these cases developed very slowly, with little tendency to necrosis. Few bacilli were present. The swine- and cat-cultures are to be classed with the bovine; the horse-culture stands intermediate. Experiments with cattle gave the following results: 1. The bovine cases either remained stationary in weight

¹ Hyg. Rundschau, Jan. 15, 1899.

² Jour. Exper. Med., vol. iii., p. 435.

³ Ibid., vol. iv., p. 451.

PLATE 2.



Photomicrograph of smear-preparation for lymph, showing the streptothrix (Flexner, *Journal of Experimental Medicine*, vol. 3).

or gained slightly; while the sputum-cases gained from 75 to 85 pounds. 2. There was marked fever in the bovine cases for 3 weeks after the inoculation; practically none in the sputum-cases. 3. There were well-marked differences in the lesions produced: (a) In the sputum-cases a tumor of cheesy consistence and encapsulated was present at the seat of inoculation in the lung; the disease spread no further (1 exception); (b) in the bovine cases disseminated tuberculosis of the lungs was found, tubercular deposits on lungs, pericardium, diaphragm, and the ribs, resembling closely the product of the spontaneous disease in cattle; extensive tuberculosis of nearly all the lymph-glands in the thorax; slight tuberculosis of other organs (in 2 of 3 cases). Among the 12 cattle used, of the sputum-cases, 1 showed no disease, 2 very slight lesions, 3 only local lesions, without dissemination. Of the bovine cases, 2 died of generalized disease, 2 showed extensive lesions, 1 showed less extensive lesions. In the case of 1 swine, the lesions were less extensive than in the bovine cases. These facts seem to show that the sputum-bacillus cannot gain lodgement in cattle through the ordinary channels. In connection with this it is noteworthy that the far more potent bovine bacillus produces in at least half of the spontaneously infected cattle a purely local disease, which would probably remain such under favorable conditions. As regards the transmission of bovine bacilli to man, we are no nearer to any definite knowledge.

DIPHThERIA.

The Durability of Passive Diphtheria-immunity.—William Bulloch¹ found that almost the whole of the diphtheria-antitoxin introduced subcutaneously into animals rapidly enters the blood, and disappears rapidly after a day or two. The disappearance was not due to excretion by the kidneys. The remainder persists, in gradually diminishing quantities, for a period varying probably with the amount of antitoxin introduced.

The Influence of Sewer-air on Lowly Virulent Diphtheria-bacilli.—S. G. Shattuck² cultivated lowly virulent diphtheria-bacilli in broth over which fecal air was allowed to pass, and found that the germs did not, even after 2 months, acquire toxic properties.

Concetti and Memmo³ do not believe that diphtheria bacilli can be divided into the 3 classes suggested by Martin; namely, small bacilli with slight toxicity, large bacilli with marked toxicity, bacilli of medium size with less toxicity than the large ones. They found that the toxicity of the different kinds was variable. The mortality was greatest where the small bacilli were found. The intensity of the toxin bears no relation to the seriousness of the case. They found the same toxicity in bacteria from both mild and severe cases.

Metin⁴ concludes, from experiments on rabbits and guineapigs, that the Klebs-Löffler bacillus does not multiply in the organs of the body when it has been introduced singly; and to find it in the blood or organs we must either perform the autopsy some time after death, or we

¹ Jour. Path. and Bact., Oct., 1898.

² Ibid.

³ Ann. Igien. Sperimentale, 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 321.

⁴ Ann. de l'Inst. Pasteur, 1898.

must have the Löffler bacillus associated with other organisms like the streptococcus and staphylococcus.

Presence of Klebs-Löffler Bacilli on the Healthy Mucosa.

—Max Kober¹ says that the literature of the subject shows the presence of diphtheria-bacilli in those coming in contact with the disease in 18.8% of the cases investigated. He found only 8% so affected. The literature gives 7% as the proportion of cases having Klebs-Löffler bacilli in their throats among those who had not come into contact with diphtheria, but the author found only 25% affected among 60 cases. In 10 of these 15 cases there had been a possibility of contagion. The cultures from all 15 were pathogenic for animals. On the second trial only one-third showed pathogenic properties. [The results in such researches must be subject to many variations, and no one percentage can be accepted as expressing the actual conditions.]

Golowkoff² considers Neisser's stain as of almost as much value in the differential diagnosis between the genuine and the pseudodiphtheria-bacillus as animal inoculation. An examination of the throats of 70 healthy cadets in a corps in St. Petersburg, in which an epidemic of diphtheria was prevailing, showed the presence of the true diphtheria-bacillus 4 times; of the false, 8 times. Among 45 servants, 2 cultures of true and 6 of the pseudodiphtheria-bacillus were obtained. From the convalescent cases the diphtheria-bacilli disappeared at the earliest in from 6 to 8 days; at the latest, in from 30 to 35 days. In healthy throats it disappeared in from 20 to 27 days.

Spronek,³ of the University of Utrecht, recommends the use of **commercial yeast in the preparation of diphtheria-antitoxin**. A kilo is diluted with 5 liters of water and boiled 20 minutes, while stirring with a spatula constantly. The mixture is poured into large flasks and allowed to stand for 24 hours, when the yeast separates. The supernatant fluid is decanted. To this slightly acidulated fluid are added 5 gm. of sea-salt and 20 gm. of Witte's peptone. It is neutralized with soda, and in addition 7 cc. of a normal soda solution are added for each liter of fluid. It is then heated, filtered, distributed, and sterilized at 120° C. The advantages of this culture-medium are: 1. Klebs-Löffler bacilli grow rapidly and abundantly on it, forming a thick, white veil on its surface. 2. The medium remains alkaline; its alkalinity increases rapidly, and the production of toxin is rapid and regular. 3. Using the same peptone under identical conditions, the same diphtheria-bacillus produces in the yeast-medium a much stronger toxin than in fermented meat-bouillon. 4. Yeast costs much less than meat, and yields more toxin per kilo. 5. The advantage of discarding putrefying meat is evident.

STREPTOCOCCUS.

Caselli⁴ introduced tampons containing virulent streptococci into the vaginas of 3 pregnant rabbits. The first animal gave birth to 4 young 15 days later, all dying the next day. The mother herself remained well until the third day of the puerperium, when she fell

¹ Zeit. f. Hyg. u. Infekt., vol. xxxi., pt. 3, p. 463.

² Diss. St. Petersburg, 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 392.

³ Arch. de Méd. expér., 1898. ⁴ Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 5.

ill, and died on the fourth day, the autopsy showing local abscesses and general septicemia. The second brought forth 5 dead young 22 days after the tamponade, remained well until the eighth day of the puerperium, and died on the eleventh day, of general pyemia. The third brought forth 6 living young that died on the same day. The animal remained well until the fifth day, and died on the tenth day of the puerperium, of general pyemia. The remarkable feature about these cases is that the streptococci remained virulent so long, and only took effect during the puerperium.

Acute General Streptococcus-infection in the Puerperium.

—J. Klitine¹ finds: 1. The organic lesions in pregnant rabbits which have been injected with antistreptococcus-serum are less pronounced than in control-animals, the cardiac muscle being the sole exception. 2. Streptococci are less numerous in the organs of those treated with the serum than in the control-animals. 3. Pregnant rabbits inoculated and subsequently treated with antistreptococcic serum survive longer than the others.

On the Constant Occurrence of Long Streptococci on Healthy Tonsils, and Their Relation to Angina.—Paul Hilbert² states that in 100 cases the long streptococcus was present on healthy tonsils. Experiments showed no cultural or toxic differences to exist between these microbes and the same streptococci taken from inflamed tonsils. They must be considered identical. From these facts, it may be concluded that it is very improbable that the streptococci cause angina. The same may be said of pneumococci, staphylococci, and other bacteria to which angina is attributed. Their role seems to be rather secondary in nature, like that of the streptococci in diphtheria.

Marmorek's Serum.—W. L. Baum,³ from a study of the literature and some personal experience, is led to draw the following conclusions: 1. In pure streptococcic infections the serum undoubtedly exercises a favorable influence on the course of the disease. 2. In mixed infections the influence of the serum is demonstrable; but it merits further trial as an adjunct to other treatment. 3. Considering the grave character of the complications of nonstreptococcic nature reported, ordinary rules of therapeutics would demand that in such cases, as with diphtheria-antitoxin, other treatment as well as the serum be employed. 4. In view of the fact that erysipelas-streptococci and phagocytes often exist side by side in the lymph-channels, it is fair to assume that the influence of the serum is directly exerted bactericidally on the streptococci, and not entirely through stimulation of phagocytic action. 5. The initial dose in all cases should be 20 cc., to be followed by 10 or 15 cc., according to the indications, each 24 hours.

TYPHOID FEVER.

Bodin,⁴ in an article on the **preservation of the typhoid bacillus in cider**, concludes that it is destroyed in a time varying from 2 to 18 hours after the contamination of the cider. The destruction results from the acidity of the cider, and occurs within the time mentioned, pro-

¹ Arch. de Sci. biol. St. Petersburg, vol. vii., Nos. 1 and 2, p. 162.

² Zeit. f. Hyg. u. Infekt., vol. xxxi., pt. 3, p. 381.

³ Medicine, Jan., 1899.

⁴ Ann. de l'Inst. Pasteur, 1898.

vided the acidity reaches 2 gm. per 100 cc. Below this figure the bacillus can survive 3 to 4 days in the cider if the acidity is from 0.8% to 1% (in malic acid), and for 20 days if the liquid is neutral in reaction. The ordinary forms of cider have, from the time of fermentation till they are consumed, an acidity of over 2%. Consequently, if watering has caused cider to be contaminated with typhoid bacilli, the liquid has infective properties, due to the presence of Eberth's bacillus, during the following 8 days.

A literary summary on **extraintestinal lesions caused by the typhoid bacillus** is published by W. T. Howard.¹ The lesions have been found in the bones, muscles, subcutaneous tissue, meninges, pleura, peritoneum, larynx, bronchi, lungs, endocardium, liver, spleen, mesenteric glands, kidneys, bladder, thyroid, parotid, ear, skin, and spinal cord.

A **histologic study of typhoid fever** is made by F. B. Mallory.² The typhoid bacillus produces a mild diffusible toxin, partly within the intestinal tract, partly within the blood and organs of the body. This toxin produces proliferation of endothelial cells, which acquire for a certain length of time malignant properties. The newly formed cells are epithelioid in character; have irregular, lightly staining, eccentrically situated nuclei; abundant sharply defined acidophilic protoplasm; and are characterized by marked phagocytic properties. These phagocytic cells are produced most abundantly along the line of absorption from the intestinal tract, both in the lymphatic apparatus and in the bloodvessels. They are also produced by distribution of the toxin through the general circulation, in greatest numbers where the circulation is slowest. Finally, they are produced all over the body, in the lymphatic spaces and vessels, by the absorption of the toxin eliminated from the bloodvessels. The swelling of the intestinal lymphoid tissue, of the mesenteric lymph-nodes, and of the spleen is due almost entirely to the formation of phagocytic cells. The necrosis of the intestinal lymphoid tissue is accidental in nature, and is caused through occlusion of the veins and capillaries by fibrinous thrombi, which owe their origin to degeneration of phagocytic cells beneath the lining endothelium of the vessels. Two varieties of focal lesions occur in the liver: one consists of the formation of phagocytic cells in the lymph-spaces and -vessels around the portal vessels, under the action of the toxin absorbed by the lymphatics; the other is due to obstruction of liver-capillaries by phagocytic cells derived in small part from the lining endothelium of the liver-capillaries, but chiefly by embolism through the portal circulation of cells originating from the endothelium of the bloodvessels of the intestine and spleen. The liver-cells lying between the occluded capillaries undergo necrosis and disappear. Later, the foci of cells degenerate and fibrin forms between them. Invasion with polymorphonuclear leukocytes is rare. Many of the phagocytic cells pass through the liver and lungs and get into the general circulation. A few come from the abdominal lymphatics through the thoracic duct. Focal lesions may arise in the kidneys by occlusion of the veins of the pyramids by emboli of these phagocytic cells. Focal collections of phagocytic cells may occur in the heart and testicles by occlusion of lymph-vessels. The various sequels of typhoid fever deserve more careful bacteriologic and histologic examination, as shown by the study in a case of abscesses of the

¹ Phila. Monthly Med. Jour., July, 1899.

² Jour. Exper. Med., vol. iv., p. 635.

PLATE 3.

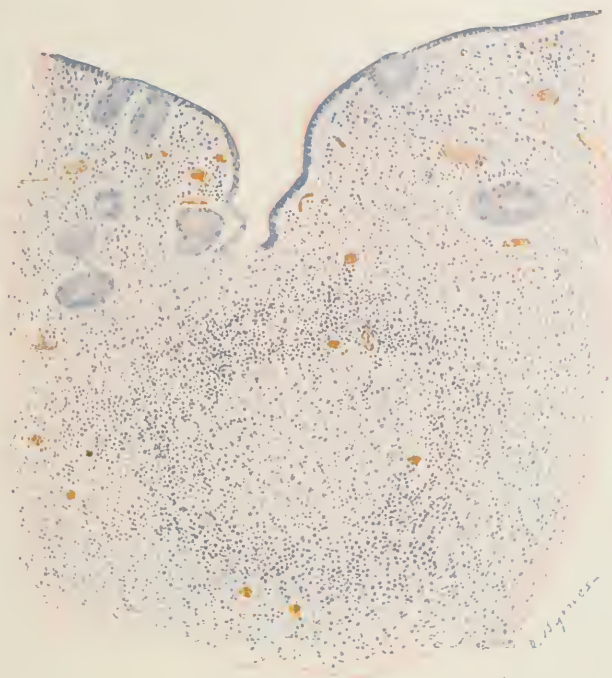


FIG. 1.

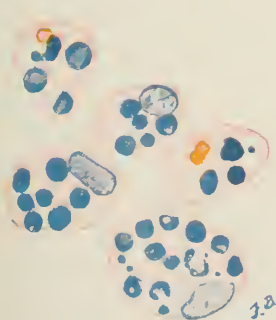


FIG. 2.

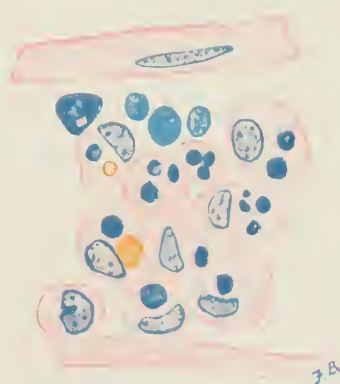


FIG. 3.

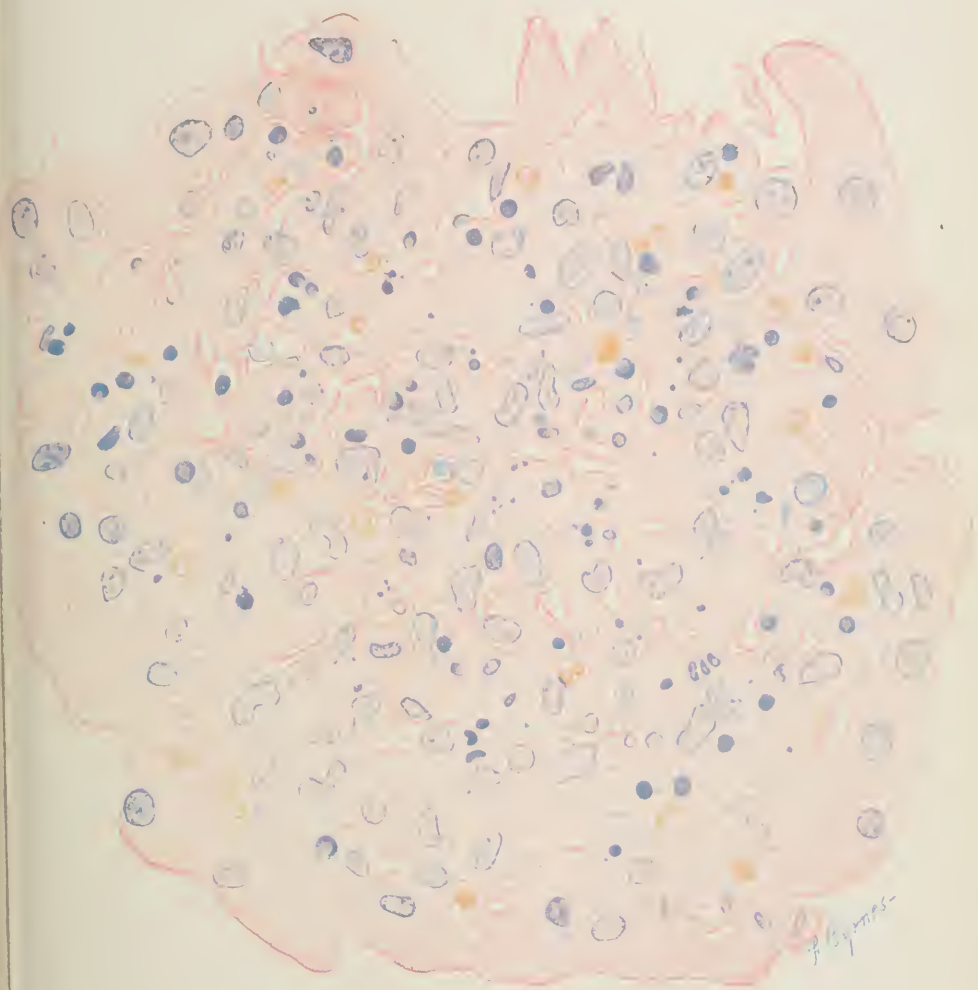
FIG. 1.—Lymph-nodule and adjoining tissue from a patch of Peyer, showing the center of the nodule occupied by large phagocytic cells.

FIG. 2.—From center of lymph-nodule, showing the newly formed cells filled with more or less digested lymphoid cells. Several red blood-globules have also been incorporated.

FIG. 3.—Lymphatic vessel of mucous membrane containing phagocytic, lymphoid, and plasma-cells.

(F. B. Mallory, Journal of Experimental Medicine, Nov., 1898.)

PLATE 4.



Large focal area in liver, consisting of phagocytic cells. The included liver-cells have entirely disappeared (F. B. Mallory, *Journal of Experimental Medicine*, Nov., 1898).

spleen, in which these seemed to arise in previously necrotic tissue, and of a case of pneumonia due to the pneumococcus, but complicated by the presence of the typhoid bacillus, in which great numbers of phagocytic cells were found in the exudation. The thrombi which occur in the heart and in the veins of the lower extremities, in the course of typhoid fever, probably owe their origin to the same sort of lesions that cause occlusion of the vessels in the intestine. Histologically, the typhoid process is proliferative, and stands in close relation to tuberculosis; but the lesions are diffuse, and bear no intimate relation to the typhoid bacillus; while the tuberculous process is focal, and stands in the closest relationship to the tubercle-bacillus.

Joseph Longworth Nichols,¹ from a study of the spinal cord by Nissl's method in typhoid fever and in experimental infection with the typhoid bacillus, concludes as follows: 1. The application of the Nissl method to the study of the motor cells of the cord and the nerve-cells of the dorsal root-ganglia in typhoid fever shows that these cells regularly suffer pathologic changes in the course of the infection. 2. The alterations in the motor cells are more constant and of a severer grade than are those in the cells of the sensory ganglia. The more characteristic changes consist of disintegration, solution, and destruction of the chromatic substance of the cell, starting from the axon-hillock and proceeding toward the nucleus. Coincidentally, the nuclei of the affected cells seek the periphery. Alterations are also suffered by the nucleus and nucleolus. In addition to this, the prevailing type of pathologic change, disintegration, etc., of the Nissl bodies situated in the periphery of the cell and in the dendrites is also observed. 3. In experimental infection with typhoid bacilli in rabbits a similar series of lesions in the corresponding nerve-cells in the spinal cord and ganglia is encountered. 4. The main or central type of lesions encountered is identical with that found in man and animals after section, destruction, or even slight injury of the peripheral nerves. 5. The examination of the peripheral nerves arising from the lumbar segment of the cord in rabbits inoculated with typhoid bacilli shows well-marked evidences of parenchymatous degeneration. 6. It is probable that lesions of the peripheral nerves in typhoid fever in human beings are common, and that the posttyphoid hyperesthesias and paralyses are due to this cause. 7. Restitution of the chromatic granules may take place in the affected nerve-cells, the new formation beginning about the nucleus and extending through the protoplasm.

PNEUMOCOCCUS AND DIPLOCOCCUS INTRACELLULARIS.

The Presence of Meningococcus Intracellularis in Suppurative Inflammation of the Conjunctiva.—Axenfeld distinguishes the chief forms of bacteria found in blennorrhœal affections as the gonococcus, the pneumococcus, the bacillus of Koch and Weeks, and the diplobacillus of Morax and Axenfeld. Less often may be found the Bacillus coli, the diphtheria-bacillus, and last a form of "intracellular diplococcus," which resembles the gonococcus and does not stain by Gram's method. The last-named has been shown to be a *staphylococcus* (as Axenfeld suspected). Recently Carl Fränkel,² in a 1½-year-old child with

¹ Jour. Exper. Med., vol. iv., p. 189. ² Zeit. f. Hyg., vol. xxxi., pt. 2, p. 221.

suppurative conjunctivitis and a thick deposit of diphtheritic nature, found on examination a pure culture of the *Diplococcus intracellularis* of Weichselbaum. The greater part of the bacteria was found in the cells, even in the nuclei; though also more or less large clusters were found outside the leukocytes. The diplococci stained only partially by Gram's method. Better results were obtained by the "Pick and Jacobsohn" method.¹ While morphologically this coccus seems identical with the diplococcus, the appearance of its colonies on blood-agar, and the absence of any pathogenic qualities (when inoculated into animals), were peculiar. It cannot be doubted, though, that the diplococcus caused the conjunctivitis. At the height of the process all other microbes disappeared from the scene, and repeated reinoculations always gave a pure culture of diplococcus. These disappeared as the affection reached its close. Finally, the healthy eye became infected. Enormous quantities of diplococci were found in the secretions, which corresponded morphologically, tinctorially, and in culture with those already present. In a second case, diplococci were found which behaved in similar manner. In a third case, pneumococci gave place in the third week of the disease to intracellular meningococci. (Also a child of 1½ years, who had occupied the same room with case 2, and no doubt became accidentally infected.) In closing, the fact is recalled that the *Diplococcus intracellularis* has been found in cases of rhinitis and otitis, and also on the healthy nasal mucosa.

Role of the Pneumococcus in the Pathogenesis of Cerebrospinal Fever.—E. Marchoux² observed an epidemic of cerebrospinal fever in Madagascar in which the pneumococcus was the only bacillus discoverable. No *Diplococci intracellulares* were found. In all the autopsies he discovered the pneumococcus in the blood and in all the organs. Three cases of pneumonia were treated by injection of serum from convalescent pneumonia patients, with favorable results.

Brodie³ observed 2 epidemics in Johannesburg, Transvaal; between times he saw some sporadic cases of a peculiar infectious disease in the miners on the coast, and had the opportunity of making 26 autopsies. In the last epidemic (1898) he made cultures in 15 cases, taking pus from the nose and its neighboring cavities, purulent exudate on the arachnoid, fluid from the ventricles of the brain, pericardial, peritoneal, and pleural fluid, blood from the heart and cranial sinuses, and from the lungs, kidney, and spleen. In 7 cases a pure culture was obtained from the spleen, pericardial fluid, and heart's blood, and in several cases from all of these sources; while in the other 8 instances no bacteria were found in these organs. From the exudate on the brain pure cultures were got twice; in 5 instances streptococci and staphylococci were also present. Cover-glass preparations from all places gave the same organisms as in the pure cultures in overwhelming numbers. The organism was Fränkel's diplococcus of pneumonia, but it was more virulent than usual. Intraperitoneal inoculation was fatal to rabbits in from 24 to 48 hours. The author concludes that the pneumococcus is the specific cause of cerebrospinal meningitis; that it settles first in the mucous membrane, causes inflammation, and from there spreads throughout the whole body by continuity. Pneumococcus-septicemia, as the result of pneumo-

¹ Berlin. klin. Woch., p. 811, 1896.

² Ann. de l'Inst. Pasteur, vol. xiii., p. 193.

³ Lancet, Oct. 22, 1898.

coccie infection, may be fatal of itself, and such seem to be the cases that are designated in literature as fulminant cerebrospinal meningitis. [As far as the most recent studies are concerned, the evidence is very strong that cerebrospinal meningitis is generally due to the diplococcus of Weichselbaum-Jaeger, and not to the pneumococcus. If it were not for the animal inoculations in Brodie's cases, it might be supposed that he had confounded the two organisms, and had really been dealing with the meningococcus; but the latter has such slight virulence in animals that Brodie's organism could only have been the pneumococcus. A great variety of organisms are capable of causing meningitis, but the ability of producing epidemicity is probably possessed only by the meningococcus and the pneumococcus.]

A study of 34 cases of **epidemic cerebrospinal meningitis** is published by R. B. H. Gradwohl.¹ A very commendable feature is the thorough manner in which the microorganism found (the *Diplococcus intracellularis*) is described. The author's conclusions, so far as they are of interest here, are as follows: Epidemic cerebrospinal meningitis is a specific infectious disease. It is not highly contagious—contagious only in the sense in which pulmonary tuberculosis is contagious. The *Diplococcus intracellularis meningitidis* is a prime etiologic factor in its causation. The Gram method of staining is a rather uncertain method of differentiating the *Diplococcus intracellularis* from the *Micrococcus lancolatus*. The *Diplococcus intracellularis* is especially pathogenic in dogs and cats. The virulence of the infection—that is, of the *Diplococcus intracellularis*—varies in different cases and in different periods in the same case. The virulence tends toward attenuation with the further progress of the disease. In cases in which the disease has gone beyond 1 month, the virulence of the organism is almost nil. Epidemic cerebrospinal meningitis can be transmitted in utero.

Tetanus.—Demonstration of Tetanus-bacilli in Organs of Experimental Animals.—Von Oettingen and Zumppe² made some interesting experiments after having observed the following case: A woman, 22 years of age, had run a sliver under the thumb-nail of her right hand, on May 4, 1897. Tetanus developed nine days later, from which she gradually recovered under the use of Behring's antitoxin. The writers went to the woman's home, secured some splinters from the floor and some earth from the garden, and inoculated 15 mice. Within 3 or 4 days 5 of the animals died of tetanus. They took the heart and spleen of one of the mice and placed them in ordinary alkaline bouillon. After 48 hours in the incubator, the bouillon containing the heart was turbid and exhaled a very penetrating odor. A smear-preparation showed a mixture of cocci and bacilli, many of the latter being of the "drum-stick" form. Injection of this culture into mice produced tetanus. The conclusion was justified that the bacilli had been present in the heart's blood and had grown aerobically. The authors then inoculated 73 animals, some with the samples from the woman's house, some with artificial splinters made by soaking pieces of wood in the bouillon-culture and letting them dry, some with pus and the splinter from the point of inoculation in animals that had died of tetanus, some with bouillon-culture inseminated with material

¹ Phila. Monthly Med. Jour., July, 1899. ² Deutsch. Arch. f. klin. Med., Band 64, S. 478.

from the inoculation-wound, and some with bouillon-cultures made from the organs of animals dead of tetanus. Of the 73 animals, 45 died; and among the latter tetanus-bacilli were found in the organs in 20 instances. The bacilli were demonstrable in the cultures as early as the second or third day. The authors were also able to find the organism in tissue-sections stained by Gram's method. They usually took a part of the organ to be examined, placed it in a moist chamber in the incubator, without excluding the air, and then were able to demonstrate the bacilli in the expressed juice after 2 or 3 days. For purposes of sectioning, the organs were hardened with sublimate and alcohol. They found guineapigs more susceptible than mice, 52% of the dead guineapigs containing the bacilli, against only 31% of the mice. As the organisms were found in different organs, it seems most likely that they were disseminated through the blood-current. Conditions favoring this dissemination are: Marked susceptibility of the animal, a high degree of virulence in the culture, and, above everything else, the use of a mixed culture. The nature of the synergic organism seems to be unimportant. Regarding the growth of the tetanus-bacillus under aerobic conditions, the authors found that this only occurs in the case of mixed cultures. Pure cultures they were only able to obtain when they grew the organisms under hydro-gen gas.

Experimental Pest-pneumonia.—Batzaroff¹ arrives at the following conclusions: 1. Laboratory animals can contract the 2 forms of pest-pneumonia observed in man, both the primary and the secondary. 2. Experimental pest-pneumonia is a lobular or confluent bronchopneumonia which generally ends in septicemia. It was produced by depositing in the nasal mucus of the animal some of the pest-virus from a gelatin-culture or from the spleen of an affected animal. 3. The disease is contagious, and the secretions of the sick animals especially the tears, nasal and bronchial mucus, are the chief infective agents. 4. Pest-virus which does not kill when inoculated into the animal will set up a pneumonia if introduced by way of the respiratory tract. 5. Attenuated virus, and that dried with albuminous matter for several weeks, can set up a pneumonia if inoculated into the nose. 6. Secondary pest-pneumonia always develops in the infected animals as the result of a natural or acquired resistance of the organism. It is peculiar in form, and leads to the formation of pseudotubercles on the surface of the lung. 7. Antipest-serum can prevent primary pest-pneumonia in animals; once present, it is hard to cure. 8. All the accessible mucous surfaces present fields for infection in this order of susceptibility: mucosa of nose, eyes, mouth, intestine, rectum, and vagina.

E. H. Hankin² finds **the rat** to be the most effective agent in the **propagation of the plague**. Overcrowding, lack of ventilation, and poor construction of the houses are subsidiary causes at best, since these factors are only of importance in so far as these houses furnish an abode for rats and are difficult of disinfection. It does not follow that rats are always the cause for propagation of the disease. In Bombay, the dead rats were eaten by ants and other insects, which carried the

¹ Ann. de l'Inst. Pasteur, vol. xiii., p. 387.

² Ibid., 1893.

remains into the domicile, and thus aided the spread of the infection. The death of rats in Bombay in large numbers has been proved by Weir and the municipal officers to have been not a concomitant phenomenon, but an effective agent in the spread of the malady. The grain-depots must be considered sources of danger; also all industrial occupations which attract rats. Strong disinfectants must be used wherever the rats can penetrate. No known method can exterminate the rats; hence vaccine and antitoxins play the most important role in arresting the disease.

Beriberi.—Pekelharing and Winekler have described a bacillus in beriberi; but Ellis¹ was unable to find this organism in the blood, spleen, stomach, nerves, and other organs. A striking postmortem finding was the increased size of the heart, the average weight in 125 beriberi cases being 13.37 oz. as against 9 oz. in 204 other cases. The corresponding figures of the spleen were 7.27 and 6.28 oz.; liver and kidneys were usually normal. The stomach in 31 out of 57 cases showed hyperemia of the mucous membrane. Ellis attributes the ocular symptoms to degeneration of the optic nerves. While in the paralytic form the peripheral nerves, in the dropsical, the sympathetic, phrenic, and vasomotor nerves are affected.

Arsamaskoff² succeeded in culturing in 6 cases of **measles** a bacillus in pure culture; the fact that he succeeded in finding this bacillus, which is discoverable with difficulty, in the blood, in the throat, and conjunctival secretion, and in pneumonic foci, in 6 cases, seems to be more than accidental, though the author does not positively claim it as specific. The bacillus is half as long as a red blood-corpuscle, and three-fourths as broad as the typhoid bacillus. It grows in bouillon better than on solid media. In 24 hours it forms a dust-like precipitate at the bottom and on the wall of the test-tube; after several days cloudiness appears, and remains constant. It does not grow at room-temperature; on glycerin-agar it grows in small white colonies with dentated edges, which microscopically show fine dark-yellow granules and seemingly produce a dark-brown pigment, which heaps up toward the center. An especially good medium is milk, in which the bacilli lived a month and a half; while on other media they died long before that time. On agar, and sometimes also in bouillon, they show peculiar degeneration-forms, which are characterized by a swelling of the ends and thickening and lengthening of the bacilli. In 1 case these club-shaped forms were found in the blood of the patient. Experimentation on white and gray mice was without result. In several cases the conjunctival secretion was examined, the bacilli being found twice; 3 times they were found microscopically in the throat-secretions, once in the purulent secretion of otitis, once in the sputum, 5 times in pneumonic foci, and once in the spleen.

Blood-parasites in Beriberi.—Fajardo³ claims to have observed a small unicellular organism in the blood of cases of beriberi. It was found both within and outside the red corpuscles. It is formed of pigmented granules, but is smaller than the plasmodium.

¹ Lancet, Oct. 15, 1898.

² Bolnitschnaja Gazeta Botkina, 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., 1899.

³ Centralb. f. Bakt., Parasit. u. Infekt., vol. xxiv., No. 25.

Scarlet Fever.—Pearce¹ has made a study of 26 cases of scarlet fever from the bacteriologic and anatomic standpoints. No light was thrown on the etiology. The only constant gross change was a **hyperplasia of the lymphoid tissue** in every part of the body. The anatomic points on which a clinical diagnosis is based (appearance of skin, tongue, and palate) are not usually seen postmortem. A false membrane in the tonsil may occasionally be seen. The microorganisms producing secondary lesions are the *Streptococcus pyogenes*, the *Staphylococcus aureus*, and the pneumococcus. The most important inflammatory complications observed, in their order of frequency, were: Acute bronchopneumonia, otitis media, suppuration of cervical lymph-nodes, acute pleuritis, and inflammation of the antrum of Highmore. The less frequent complications were: Abscess of the lung, ulceration and abscess-formation in the upper respiratory tract, acute endocarditis, inflammation of the sphenoidal sinuses, and metastatic abscesses of the kidney. The infections of the middle ear, antrum of Highmore, and sphenoidal sinuses are of great practical importance. The histologic examination of the skin, tongue, and mucous membrane of the mouth and pharynx showed the changes to be inflammatory as well as vasomotor. The lesions in the gastro-intestinal tract consist of degenerative changes in the epithelium and proliferation and degenerative processes in the lymph-nodules. The changes in the heart-muscle were fatty degeneration and fragmentation. Two forms of focal lesions occurred in the liver. One was due to accumulation of phagocytic cells in the capillaries, leading to occlusion of the vessels and necrosis of the included liver-cells. The other was due to a necrosis of liver-cells in the centers of lobules, followed by an infiltration of leukocytes. The changes in the spleen consisted of a proliferation of the endothelial cells in the centers of the Malpighian bodies and of the endothelial cells lining the blood-sinuses. In the lymph-nodes a similar proliferation took place in the lymph-nodules and lymph-sinuses. An abundant formation of plasma-cells was seen both in the spleen and in the lymphoid tissue generally. A study of the kidneys showed acute interstitial nephritis to be the most important lesion. Glomerular lesions only occurred late in convalescence. The most marked cell-change in scarlet fever is the production of plasma-cells in the spleen, lymph-nodes, and lymphoid tissue throughout the body. In certain cases these cells are present in large numbers in the circulation, and may emigrate in large numbers into the tissues of the kidney and lung, the process being analogous to one mentioned by Councilman as occurring in diphtheria. A less frequent change is the production of phagocytic cells from the endothelium of lymphoid tissue and from that of the bloodvessels of the spleen and liver. The proliferation of the endothelial cells is analogous to that described by Mallory (see p. 312) as occurring in typhoid fever. Pearce is inclined to attribute the proliferation of plasma endothelial cells to the toxin of scarlet fever rather than to the secondary infections which are so frequently present.

Class,² in a special culture-medium, has isolated from the scales and

¹ "Scarlet Fever: Its Pathology, Histology, and Bacteriology;" Medical and Surgical Reports, Boston City Hospital, 1899—reprint.

² Phila. Med. Jour., May 13, 1899.

throats of scarlet-fever patients a **diplococcus** which he considers the **specific cause of scarlet fever**. The culture-medium consists of ordinary glycerin-agar, plus 5% by weight of sterile black garden-earth. The microorganism resembles the gonococcus in shape, is partly-decolorized by Gram's method, and appears to be nonpathogenic to rabbits and guineapigs. [While it is not impossible that the author has found the long-sought specific organism of scarlet fever, we are compelled to be skeptical until the more detailed researches in which Class is engaged are published. Pearce's results noted above were entirely negative as far as a specific organism is concerned.]

Malta Fever.—The Micrococcus Melitensis (of Bruce).—Herbert E. Durham¹ states that in agar- or broth-cultures at 37° C. the micrococcus occurs singly or in pairs. Chains of from 10 to 14 members have been found after 10 days' incubation on broth-cultures. A bacillary form also occurs in cultures which have been grown at ordinary temperature (18° to 20° C.). The length of these bacilli is 2 to 4 times their breadth; some of them are somewhat curved. In subcultivations on agar or broth to 37° C. they revert to the ordinary coccus-type in pure culture. No motility was observed. The Gram-Weigert stain was not retained. By intracerebral inoculation, it is demonstrably pathogenic for rabbits and guineapigs. Occasionally, intraperitoneal injection proves fatal to guinea-pigs. The *Micrococcus melitensis* is found in the urine of infected animals long after inoculation. Rabbits and guineapigs inoculated with the coccus develop special agglutinins in their blood, together with substances antagonistic to the existence of the coccus.

Whooping Cough.—Behla,² like Deichler and Kurloff, has found an ameba-like organism in the sputa of whooping cough, and proclaims it as the cause of the disease. It is best observed in the fresh sputum on a warm stage, and is recognized by its ameboid movement and its considerable size. It may be differentiated from a leukocyte by the presence of a pulsatile vacuole. Shining bodies, believed by the author to be sporocysts, are sometimes seen in the ameba. The parasites are most abundant during the convulsive stage.

Acute Articular Rheumatism.—Bettencourt³ found the bacillus described by Achalmé in 1 case of acute articular rheumatism. Three cc. of blood obtained from the median cephalic vein were distributed into 3 Pasteur anaerobic culture-tubes, 1 containing plain meat-broth, the other 2 equal parts of milk and bouillon. After standing 24 hours at a temperature of 36° to 37° C., the first tube remained unchanged; the other 2 showed gas-bubbles and curds. The bacillus had round, sometimes straight, ends, was from 3 to 6 μ long and 0.75 μ wide, and occurred singly, in parallel pairs, or in chains of 7 or 8 elements. After a few days involution-forms appeared. Sporulation was not observed. The bacillus stained readily, especially with Kühne's methylene-blue; also with Gram's stain.

James H. Wright⁴ states that **madura foot**, or **mycetoma**, is a chronic inflammation characterized by suppurative nodular swellings and sinus-formation, with enlargement and distortion of the parts affected. There may be a rarefying osteitis. In the diseased tissue are found peculiar

¹ Jour. Path. and Bact., p. 377, 1898.

² Deutsch. med. Woch., No. 19, 1898.

³ Arch. de Méd., tome 2, No. 2.

⁴ Jour. Exper. Med., vol. iii., p. 421.

granules resembling gunpowder, in some cases hard, black, and irregular; in others they are soft and white or yellowish-white. The results of those who have observed the disease go to show that it is due to at least 2 different organisms. The melanoid granules are composed essentially of a fungus or a hyphomycete; the ochroid granules consist for the most part of organisms of the streptothrix group, to which actinomyces is now supposed to belong. It seems not unlikely that some cases of the ochroid variety are cases of actinomycosis. In a case of the melanoid type, the granules were found to consist of a mycelium of hyphæ or fungoid elements, more or less degenerated, embedded in or surrounded by a hyaline, brown-colored, refractive substance, which itself forms more or less of a reticulum. The Gram and the Weigert fibrin-stain were used. The morphologic and cultural appearances are described. No results were obtained from inoculation of animals with the original granules or with cultures. The nodule formed around the granule resembled closely a tubercle.

August Jerome Lartigan¹ observed 15 cases of **epidemic dysentery**, with typical dysenteric symptoms, **caused by the *Bacillus pyocyaneus***. In many the stools showed a distinct green color, most marked after exposure to the air. The *Bacillus pyocyaneus* was present in almost pure culture in every specimen of the intestinal discharges examined, the *B. coli communis* in 2 specimens in very small numbers, and *Proteus vulgaris* in 3 specimens. Associated with these were a few colonies of ordinary intestinal saprophytes. Examination of 5 samples of the well-water used by the patients demonstrated abundant colonies of *B. pyocyaneus*, elaborating a green pigment. Animal experiments showed this organism to be possessed of a considerable degree of virulence. Calmette and Maggiora have shown the not infrequent occurrence of this microorganism in dysentery. It has also been found occasionally in the diarrheas of children. While not a common etiologic factor in epidemic dysentery, the author thinks the *B. pyocyaneus* to have been unquestionably the cause of this epidemic.

Wm. S. Thayer and J. W. Lazear² report a second case of **gonorrheal septicemia** and ulcerative endocarditis, with observations upon the cardiac complications of gonorrhea. The interesting features were (1) the **extensive and sole involvement of the tricuspid valve**, and (2) the **changes in the kidney**. Much pus had been present in the urine. Its source was evident from the signs of passage of numerous leukocytes directly through the capillaries of the glomeruli into the glomerular spaces and the urinary tubules. The extensive thrombosis of the glomerular capillaries and the accumulations of fibrin in the glomerular spaces formed a very remarkable picture. From a review of the existing cases on record, these conclusions are reached: 1. An acute gonorrheal urethritis may be the starting-point for a grave general septicemia, with all its possible complications. 2. These infections may be mixed or secondary, due to the entrance into the circulation of organisms other than the gonococcus; or they may be purely gonococcal in nature. 3. Endocarditis is an occasional complication of gonorrhea. 4. This endocarditis may be transient, disappearing with but few apparent results; or it may leave the patient with a chronic valvular lesion; or it may pursue

¹ Jour. Exper. Med., vol. iv., p. 595.

² Ibid., p. 81.

a rapidly fatal course, with the symptoms of acute ulcerative endocarditis. 5. The endocarditis associated with gonorrhea is commonly due to the direct action of the gonococcus; but it may be the result of a secondary or mixed infection. 6. Pericarditis may occur also as a complication of gonorrhea; but it is less frequent than endocarditis. It may, as in the case of the latter, be the result either of a pure gonococcal or of a mixed infection. 7. Grave myocardial changes—necrosis, purulent infiltration, embolic abscesses—are common in the severe gonococcal septicemias. 8. In instances of gonorrheal septicemia, the diagnosis may in some cases be made during life by cultures taken from the circulating blood according to proper methods.

Gauthier,¹ in a case of yellow fever, isolated Sanarelli's bacillus from the urine.

GENERAL BACTERIOLOGY.

Effect of Symbiosis of Bacillus Coli Communis with Other Bacteria.—Coco² found that in the presence of the streptococcus or staphylococcus the virulence of the colon-bacillus was raised. The simultaneous introduction of the colon-bacillus and the staphylococcus produced a marked rise in temperature and a rapid decrease in weight. The colon-bacillus alone caused either none or a very slight temperature-rise. The effect of the simultaneous infection was always more marked when some cause had already acted upon the intestinal canal.

On the Diplococcoid Form of the Colon-bacillus.—J. C. Adami, Maude E. Abbott, and F. I. Nicholson³ conclude: 1. The short form of the normal colon-bacillus grown on the ordinary media frequently presents polar staining. 2. In the more filamentous forms a succession of these more deeply staining bodies is at times found. 3. Growth outside the body under relatively unfavorable conditions renders the polar staining more prominent, so that the shorter forms may resemble diplococci closely, and the filamentous forms show a common unstained or lightly staining sheath, in which is to be made out a succession of minute dots in pairs, and of somewhat larger, more ovoid dots. 4. Certain fluids which contained the colon-bacillus—the ascitic and peritoneal fluids from a case of hepatic cirrhosis and of peritonitis, respectively—yielded diplococcoid growths so modified that the authors were not able to cause them to revert completely to the normal type. It is by the prolonged action of these fluids that these changes have been produced in the colon-bacilli. 5. Bile, and the ascitic fluid from a case of hepatic cirrhosis, were found to possess the properties of modifying the colon-bacillus in a similar manner, and of slightly inhibiting its growth. 6. These modified colon-bacilli are relatively minute, assume a diplococcoid form, are nonmotile, form pin-point colonies upon agar-agar, cause but slight turbidity in broth, and an almost invisible growth upon potato, act but slowly on litmus-milk, have lost the power of fermenting glucose-lactose and dextrose-broths, and do not develop the indol-reaction. Experiments on rabbits seem to show: 1. That the colon-bacillus injected into the circulation is rapidly taken up by both the liver and the kidney. 2. That within $\frac{1}{4}$ hour after

¹ Rev. d'Hyg., p. 884, 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 390.

² Gaz. degli Ospedali, No. 10, 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 86.

³ Jour. Exper. Med., vol. iv., p. 350.

inoculation some bacilli are already ingested by the endothelial cells in the liver. 3. That in this process of ingestion the bacilli are broken up into shorter lengths, and that these short, stumpy bacillary forms may already within the endothelial cells present themselves as 2 deeply staining dots, and may thus resemble diplococci. 4. That as early as in 2 hours the modified bacilli may be discharged outwardly from the endothelial cells and be taken up by the underlying liver-cells. 5. In the liver-cells the modified bacilli are to be recognized as diplococci of a size varying from that equal to the diplococci seen in the endothelial cells, down to points of extreme tenuity; evidently these forms are undergoing destruction. 6. In the kidney the same process is at work. The conclusion is reached that the type of the colon-bacillus is a stumpy bacterium with rounded ends, consisting of at least 2 parts, one which takes deeply the stain, the other relatively nonstaining. Under ordinary conditions of free and rapid growth, these are not to be distinguished from each other; under other conditions, more especially those of difficult growth, the chromatin tends to be aggregated along the axis of the bacillus—most characteristically in the stumpy bacillary form—as 2 rounded bodies, and thus the appearance is given of a diplococcus, a capsulated diplococcus, the apparent capsule being the nonstaining body-substance.

T. M. Cheesman and S. J. Meltzer,¹ from a series of experiments on the **inoculation of bacteria into the spleen**, conclude: 1. Cultures of *Bacillus coli communis*, *Bacillus typhosus*, and *Staphylococcus pyogenes aureus* injected into the tissue of the normal spleen soon disappear from that organ and from the normal body generally. 2. Bacteria injected into the spleen after all or part of the vessels have been tied, multiply in the spleen with great rapidity and continue to supply bacteria to the blood, whence in the healthy body they soon disappear. 3. Bacteria injected into the spleen or subcutaneous tissue, or into the blood-current through the ear-vein, in cases in which moderate lesions have been made by cauterization or compression in the spleen, liver, kidney, uterus, testicle, peritoneum, or subcutaneous tissue usually, find lodgement in these tissues, and multiply there. 4. Even in cases in which numerous foci existed from which the blood was constantly provided with a fresh supply of bacteria, only few bacteria were found at any time in the blood.

Bactericidal Functions of the Liver and the Etiology of Progressive Hepatic Cirrhosis.—J. C. Adami² gives an account of further researches on the bacterial origin of hepatic cirrhosis. In his first paper³ he pointed out the similarity between a disease of Nova Scotia cattle, known as the Pictou cattle-disease, and human cirrhosis, and described a microorganism which he had also obtained from cirrhotic human livers. In the present article he reports a case of cirrhosis in which, in the liver and other organs, a polymorphous bacillus was found occurring in the early cultures as a diplococcus, and later assuming a diplobacillary form. It resembles the colon-bacillus, and is probably a variety of it. At first, in early cultures, the organism differs; but by passage through rabbits it acquires the ordinary characters. Adami believes, as do many writers, that under the term colon-bacillus numerous forms

¹ Jour. Exper. Med., p. 533.

² Montreal Med. Jour., Dec., 1898; Medicine, Feb., 1899.

³ YEAR-BOOK for 1899, p. 673.

are included which may in the future be differentiated. Cultures of colon-bacillus isolated from the liver in cases of cirrhosis a few hours after death are markedly attenuated or modified, only gaining typical characters after repeated cultures outside of the body. Parallel inoculations into rabbits of the cirrhosis-bacillus and from dead stock laboratory-cultures of the colon-bacillus gave similar results. In the liver-cells the bacilli assumed, in the main, a diplococcus-form. The colon-bacilli injected into the bloodstream find their way into the liver-cells, and are present in greater numbers there than in the spleen, kidney, or other organs. The organisms seen in the liver within 24 hours after inoculation are, in the main, either dead or, at least, incapable of proliferating outside of the body. The change in form of the bacillus accounts for the numerous diplococcus-forms found post-mortem in appendicitis and other diseases. When grown at an unfavorable temperature outside of the body, similar morphologic modifications may be produced. Similar appearances were found in 40 cases examined in which there was no demonstrable cirrhosis of the liver. From this the author concludes that the colon-bacilli in small numbers are very constantly finding their way into the final branches of the portal circulation, and that one of the functions of the liver is to arrest the further passage of these bacilli into the general circulation, and to destroy them through the agency of the specific cells of the organ. These observations appear to controvert the view that there is any necessary connection between the presence of the colon-bacillus in the liver and the development of cirrhosis. In the absence of cirrhosis, the forms that are present are almost all corpses, and scarcely stain at all. In cirrhosis, on the other hand, while many are nontingable, many are present that stain well. The author considers that the great number of those forms found in advanced cases of cirrhosis show a direct relation of this change to the infection. In these cases the mesenteric lymph-glands are also crowded with diplococci. [The upshot of these observations seems to be that the bacillus found by Adami is not the cause of cirrhosis.]

The Pleomorphism of the Common Colon-bacillus.—H. C. Haslam¹ finds that the *Bacillus coli communis* has the greatest average length, proportionate to its breath, in such nitrogenous media as proteid and ammonium tartrate; whereas in glucose, to which a minimum of nitrogenous matter has been added, it is least. In leucin, which contains an amount of nitrogen intermediate between the two, the bacillus is also intermediate in size. Food-stuffs thus have an important bearing on the shape, size, and structure of bacilli.

Thermophilic Bacteria.—P. Tsilinsky² says that 2 species of actinomyces were found growing at a temperature of 48° to 68° C.; they are both *thermoactinomyces vulgaris*. The former is generally distributed, and was found in earth, hay, straw, manure, different cereals, potato, etc. Isolated and grown on ordinary culture-media, it appeared as large, branching filaments about $\frac{1}{2}\mu$ wide. Sporulation readily occurs, especially on potato, the spores appearing as round or oval swellings at the end of the filaments. The mycelium is easily colored by anilin dyes and by Gram's method. The most favorable temperature for its growth was 57° C., and the best culture-medium bouillon. The spores resist ordinary disinfectants. Microscopically, the colony resembles the ordinary actino-

¹ Jour. Path. and Bact., vol. v., p. 194.

² Ann. de l'Inst. Pasteur, vol. xiii, p. 500.

myces closely. It can liquefy gelatin, and is aerobic. Injected under the skin or into the peritoneal cavity of rabbits or guineapigs, it produces no local or general morbid phenomena. The second type is characterized by larger filaments 1.2 to 1.5 μ wide. Its spores take the stain, it does not liquefy gelatin, and grows feebly in the anaerobic state. Another microorganism was isolated, called the *thermomyces lanuginosus*, on account of the downy appearance of its culture on bread.

The Role of Insects, Arachnids, and Myriapods as Agents in the Spread of Diseases due to Bacteria or to Animal Parasites in Men and Animals.—The spread of anthrax by flies is affirmed by some and denied by other writers. George F. Nuttall¹ concludes that in some cases ordinary house-flies can and do carry the infection, but not as a rule. In cases of plague, Nuttall has shown that infected flies can survive several days with virulent bacilli in their bodies. Hankin thinks that rats are a chief source of contagion. Their corpses are eaten by ants, which invade houses, and so spread the disease. Simmonds holds that probably fleas from dead rats invade the human subject, carrying infection by biting. Nuttall has shown that bedbugs infected with anthrax, mouse-septicemia, or chicken-cholera are not capable of infecting mice. Septicemia, pyemia, erysipelas, and recurrent fever have been found to follow insect-bites. That flies play an important part in the spread of cholera is beyond doubt (Maddox, Sawtschenko, Simmonds, Macrae, Haffkine and Simpson, Buchner). Veeder has ascribed the prevalence of typhoid fever in the military camps of America (1898) to the flies swarming everywhere. No proof of the conveyance of tuberculous infection by flies or bedbugs has yet been furnished. It seems probable, on the other hand, that leprosy is spread by the parasites infesting the skin.

Alibert, Wilson, Hirsch, and Cadet believe frambesia to be communicable by bites of flies and other insects; the last named thinks some abrasion-wound necessary. Laveran thinks the "boil-disease" can be conveyed by flies. Egyptian ophthalmia and Florida sore-eye are known to be spread by flies. Pediculi inoculate favus and impetigo when transplanted from such cases to healthy people. Leidy, from experiences in the Civil War, concluded that flies could cause the spread of hospital gangrene. Of the Ixodidae, only the *Ixodes bovis* has been proved to be pathogenic; its role in Texas fever is well known. The *Argas reflexus*, *Argas persicus*, and *Argas americanus* poison the organism, which becomes, therefore, more susceptible to bacterial invasion; but no proof exists that they introduce bacterial products by their sting. Neither is this the case for the *Sarcopsylla penetrans* or the *Trombididae*. A long list of animal parasites follows, with the disease-processes they set up. Most important are different forms of tænia, distomum, filaria, and the tsetse-fly. Coplin,² in a series of experiments, found that flies, roaches, and bedbugs could readily carry the typhoid bacillus. The insects remained alive for from 24 to 48 hours, and during this time readily transported the typhoid germs with which they were infected to media upon which they were placed. [These observations and theories are pregnant with suggestion for the sanitarian. Flies have been looked upon as harmless pests, against which very little effort at destruction has been made. If it is realized

¹ Hyg. Rundschau, vol. ix., pp. 209-610.

² Phila. Med. Jour., June 10, 1899.

that they play a part in the transmission of infectious diseases, our attitude toward them will become quite different. Yet it should not be forgotten that they may have an attenuating influence on the germs they ingest, and in this way be helpers in the combat with infectious diseases. That phase of the subject needs investigation.]

Appel¹ has used Löffler's mouse-bacillus (*Bacillus typhi murium*) with success in ridding a garden of mice. He found bouillon-cultures of the bacillus most satisfactory.

Emile Laurent,² in **experimental researches on the bacterial flora of plants**, finds that the *Bacillus coli communis* has no parasitic properties for living plants under normal conditions. But it can acquire virulence by successive cultivation on potatoes plunged for some time in alkaline solutions which diminish their natural resistance. The natural resistance of potatoes and carrots for their cryptogamic enemies can be so diminished, for instance, by the addition of a large amount of lime to the soil, that the *B. coli communis* and the *B. fluorescens putridus* can attack them and become true parasites. [The study of pathologic processes in plants should prove of great interest, and might possibly add valuable data to the subject of comparative pathology. Some work in this line has been done by Shattuck in England.]

Ray-fungi.—O. Lubarsch³ states that the actinomyces-forms, which until recently were considered as characteristic of a definite disease-producing germ, appear under certain conditions in a large number of fungi which belong to the streptothrix group. The ray-fungi and club-shaped forms are not the expression of simple degeneration, but denote an altered or hindered development. A large number of the fungi of this group produces ordinarily only local disease, even in susceptible animals; general infection occurs only when the whole circulation or lymphatic channels are flooded with the microorganisms. This group of germs, whether they are called streptothrices or ray-fungi, should not be placed among the cleft-fungi or the hyphomycetes, but considered as an intermediate form between the two. The ray-fungi must be classed as a subdivision of streptothrices. Only those organisms which under some conditions can produce genuine colonies of ray-fungi with typical clubbed or beaded appearance should be placed in this class. [According to the observations of Coppen Jones (see YEAR-BOOK for 1896, p. 992), Craig, and others, the tubercle-bacillus is capable of assuming branching forms similar to those of the ray-fungi.]

A Pathogenic Sarcina.—Löwenberg⁴ found the sarcina in the nasal cavities of a patient who had long suffered from ozena of an abnormal type. The nasal mucus consisted of numbers of polynuclear leukocytes and an enormous quantity of sarcinae bundles. No other microorganisms were found. Cultures gave numerous colonies of pure sarcinae. Treatment caused complete disappearance of the microorganism and the symptoms. The sarcina was immobile, and stained well with anilin bases and by Gram's method. It grew well on the ordinary liquid media and at the ordinary temperature, but better in the oven.

¹ Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 373.

² Ann. de l'Inst. Pasteur, vol. xiii., p. 1.

³ Zeits. f. Hyg. u. Infect., vol. xxxi., pt. 1, p. 216.

⁴ Ann. de l'Inst. Pasteur, vol. xiii., p. 358.

It also grew in *anaerobic* culture without developing gas or odor. It was peculiar in being pathogenic for rabbits, guineapigs, and white mice. Most of the animals died within 24 hours. In rabbits and guineapigs peritonitis was produced, and sarcinae were found in the peritoneal and pleural fluids; also in the heart's blood, which gave a pure culture. The question is raised whether the alkalinity of the nasal secretions permitted the sarcina to develop pathogenic qualities.

Franklin Warren White has made a study of **cultures from the blood in septicemia, pneumonia, meningitis, and chronic diseases.** Blood for bacteriologic examination during life should be taken directly from the veins, and in considerable quantity. Resorption of toxins is the most important feature in cases of sepsis; pyogenic bacteria invade the general circulation in a rather small proportion of severe cases, and, as a rule, late in the disease. A general infection by the pneumococcus can be demonstrated occasionally in the late stages of acute lobar pneumonia. The value of blood-cultures as a means of diagnosis in obscure cases of sepsis is limited by the fact that invasion of the blood by the specific organism cannot be demonstrated during life in the majority of cases. Positive cultures are very valuable; negative cultures do not exclude local septic infection. The detection of specific bacteria in the blood of cases of sepsis and of pneumonia gives a very unfavorable prognosis in most cases. General terminal infections with pyogenic cocci occasionally recur as an immediate cause of death in chronic disease. Local infectious processes play this part more frequently. As far as experiments have shown, invasion of the blood by bacteria during the death-agony, with subsequent distribution of the germs to the organs by the circulation, is a rather uncommon occurrence. Owing to the relative infrequency of agonal invasion, it may be assumed that in the majority of cases where autopsy is performed promptly after death, the bacteria which are found in the organs succeeded in reaching these organs previously to the death-agony, and are associated with the course of the disease. The presence of bacteria in the organs in late autopsies is due in many cases to postmortem extension from one organ to another, and in some cases to the postmortem growth of small numbers of germs which were distributed to the organs by means of the circulation.

Estimation of Acid Formed by Bacteria.—Hanna¹ diluted fresh ox-serum 10 times with distilled water and sterilized it by steam at 100° C. No clotting occurred, but a faint precipitate of serum-globulin formed in the fluid. It was concluded that the proteid matter of the serum had become changed by heating into alkali-albumin. Organisms grew but feebly or not at all on this medium. Different sugars were added to the extent of 1%, with generally a favorable result on the luxuriance of the growth. Acid-production took place to a marked degree. As the result of the acid-production from the carbohydrate, the alkalinity of the medium gradually diminished, and when the neutral point was reached or a faint trace of acid showed itself, the whole of the proteid which had been converted into alkali-albumin was precipitated as a white clot. The quantity of acid needed to cause this precipitate can be readily estimated by a decinormal sulphuric-acid solution. This method forms a ready means of discovering the relative power of microorganisms to cause

¹Jour. of Path. and Bact., p. 268, 1898.

fermentation in any given sugar, and is a measure of the acid-production. A table of results with different bacteria is given.

A New Method of Staining Spores.—Klein¹ believes that bacteria are stained more easily when moist than when dry and fixed. Upon this belief is based the following method of staining spores: An emulsion is made in a watch-glass in a few drops of physiologic salt solution of an öse of germs—anthrax, for example—from a potato-culture. To this a like quantity of filtered carbol-fuchsin is added. The whole is warmed to steaming for 6 minutes. A cover-glass is spread, and allowed to dry in the air, by passing through the flame, decolorized in 1 % sulphuric acid for from 1 to 2 minutes, washed in water, counterstained with dilute, watery, alcoholic methylene-blue, without heat, for 3 or 4 minutes, and washed in water. It is then ready for mounting.

TOXINS, ANTITOXINS, AGGLUTINATION.

Theobald Smith,² considering the **relation of dextrose to the production of toxin in bouillon-cultures of the diphtheria-bacillus**, concludes: 1. Dextrose is not in itself injurious, but somewhat favorable to toxin-production. When added in quantities not exceeding 0.2 % to peptone-bouillon freed from fermentable acid-producing substances (muscle-sugar), it leads to a maximum accumulation of toxin by utilizing the available peptone to the best advantage. 2. The different courses taken by cultures of diphtheria-bacilli in ordinary unfermented peptone-bouillon containing muscle-sugar, and in peptone-bouillon made from fermented infusion to which 0.1 % to 0.2 % of dextrose has been added, are manifested by an increased production of toxin in the latter, as well as by a rapid return from an acid to an alkaline reaction. In the former an acid reaction may prevail even under most favorable conditions. 3. These differences may be explained by assuming either that the acid products of the muscle-sugar are different from those of dextrose and nonutilizable, or else that the bouillon contains certain other unknown inhibitory substances removed during fermentation. The use of synthetized media, and an analysis of the acid products in fermented bouillon plus dextrose and in unfermented bouillon, would aid in explaining the differences. 4. Among the accessory conditions which favor toxin-production in unfermented bouillon, as pointed out by Park and Williams, are increased quantities of peptone, well-developed surface-growth of the diphtheria-bacilli, and a low initial acid reaction. In fermented bouillon these accessory conditions are also favoring, though of less importance.

On the Agglutination and Dissolution of the Red Corpuscles by the Serums of Animals Injected with Defibrinated Blood.—In a previous article, Bordet³ called attention to the following facts: 1. That the serum of animals vaccinated against cholera produces an agglomeration of the cholera-vibrios *in vitro*. If the serum is fresh and is added in sufficient doses, the agglutinated vibrios are transformed into granules. This transformation into granules is an evidence of a marked bactericidal action. 2. The serum heated to 55° C. or kept for a long time loses its power of transforming the vibrios into granules, but

¹ Centralbl. f. Bakt., Parasit. u. Infekt., vol., xxv., p. 376.

² Jour. Exper. Med., vol. iv., p. 397.

³ Ann. de l'Inst. Pasteur, June, 1895.

preserves its agglutinating action. 3. If to the cholera-serum previously heated, and thus deprived of the power of transforming vibrios into gramules, a little fresh serum from an unvaccinated animal is added, the bactericidal power is restored; and yet the heated protective serum lends itself readily to the culture of the microorganisms, and the serum of the unvaccinated animal has but little bactericidal power. Isolated, therefore, the 2 are scarcely or not at all bactericidal; associated in the mixture they act with great energy on the bacteria. From these facts, Bordet concludes that the bactericidal power, such as was present in the serum of vaccinated animals, is due to the combined action on the microorganism of 2 distinct substances, the first belonging to the serum of the immunized animal, endowed with a specific character, and capable of acting in very small doses and resisting heat—the serum containing this substance also having the power of producing agglutination; the second, present in unvaccinated as well as vaccinated animals, destroyed at a temperature of 55° C., nonspecific, and having only a feeble activity when not associated with the first, but manifesting a powerful energy when it is brought in contact with the specific substance in the serum of vaccinated animals. One can understand from this why the injection into normal animals of cholera-serum, either intact or previously heated, should have as a consequence the appearance in the serum of those animals of a specific bactericidal power. The agglutinating power which is most marked in the serum of vaccinated animals is found to some degree in the serum of the unvaccinated. Bordet also calls attention to the fact that the serum of one animal generally agglutinates the red corpuscles belonging to an animal of a different species. Sometimes this agglutination is quite intense; the serum of the chicken, for example, agglutinates the erythrocytes of the rat, and especially of the rabbit, with a surprising energy. It first agglutinates and then even destroys the red corpuscles of the latter. Heated to 55° C., it agglomerates them just as strongly, but does not destroy them. These facts have led Bordet to perform a series of experiments,¹ in which he injected into normal animals defibrinated blood coming from a different species, and found that the blood of the injected animal presented an increased agglutinating power as well as a more marked destructive action upon the red corpuscles of the animal with the defibrinated blood of which it had been injected. Guinea-pigs received 5 or 6 successive injections of 10 cc. of the defibrinated blood of the rabbit. At the end of the injections some blood was withdrawn from the guinea-pigs, and the serum was found to present the following characteristics: 1. Placed in contact with defibrinated rabbits' blood, it agglutinated the red cells with great energy. 2. The agglutinated red corpuscles afterward presented phenomena of a rapid and intense destruction. 3. If the serum of the guinea-pig was heated to 55° C. for $\frac{1}{2}$ hour, it lost its property of destroying the red corpuscles, but remained powerfully agglutinative. 4. If to a mixture of defibrinated blood and heated serum a quantity of fresh serum from a normal guinea-pig (one that had not received any injections) or from a normal rabbit was added, the globulicidal phenomena at once became manifest. If there is in the mixture of the heated serum and the defibrinated rabbits' blood a slight destruction of red corpuscles, this is due to the fact that the defibrinated blood con-

¹ Ann. de l'Inst. Pasteur, No. 12, p. 688, 1898.

tains not only red cells, but also serum charged with some alexin. It is thus seen that the alexin of the normal rabbit acts upon the red cells of the same animal when these are impressed by the agglutinating substance of active serum. The serum of normal guineapigs has only a feeble agglutinating action upon the red cells of the rabbit. The active serum of the treated guineapig exercises no influence upon the defibrinated blood coming from a normal guineapig; it is equally devoid of action upon the red cells of the pigeon; it agglutinates strongly the red cells of the rat and mouse, but they are also agglutinated energetically by the serum of the normal guineapig. If one injects into the peritoneal cavity of a treated guineapig (treated with successive injections of rabbits' blood) a quantity of defibrinated rabbits' blood, the red cells introduced are rapidly destroyed. If the injection is made into the peritoneum of a normal guineapig, the red cells are not altered in the exudate, and are finally engulfed by macrophages. If one injects into the peritoneal cavity of a normal guineapig rabbits' blood mixed with a small quantity of active serum previously heated to 55°C ., the same phenomena of destruction of the red cells are produced. The active serum which displays such a strong energy toward the cells of the rabbit is toxic for this animal. Injected into the vein of the ear, in doses of 2 cc., it kills. Bordet points out the strong parallelism between the bactericidal and globulicidal properties of the blood. The analogy between them leads to the conclusion that the properties of cholera-serum, for example, are not created, if one may so speak, with an antiinfection end in view, but that they are nothing more than the energizing against the bacteria of pre-existing functional faculties, which can also be directed, if the circumstances demand it, against harmless elements, such as the red globules. These properties are no more spontaneously created for defence against the microorganisms than phagocytosis, which Bordet calls the "pivot of immunity," and which does not owe its existence and its *raison d'être* to the conflict with the virus. He is in accord with the conclusions of Metschnikoff, that immunity is nothing more than an instance of intracellular digestion, a happy application to the defence of the organism of a primordial function which would exist in no less a degree if there were no pathogenic germs on the surface of the earth.

Agglutination and Destruction of the Red Blood-corpuscles by Serum.—This is a continuation of Bordet's¹ previous work. His conclusions only need be given. 1. The serum of animals treated with defibrinated blood coming from an animal of different species has the property of agglutinating and destroying corpuscles similar to those injected. In certain cases it is also capable of causing a precipitate in serum (or defibrinated blood) similar to that which had been introduced into the organism [homologous serum]. 2. The destructive action of active serum on the corpuscles is due to the presence of 2 substances: One is inherent in active serum; the other (alexin) is distributed equally in fresh and in active serum. The first acts by rendering the corpuscles susceptible to the action of the second. These facts must be considered in connection with the results obtained with cholera-serum and the cholera-vibrio. 3. Injection of "antihematic" serum into a normal animal (of the same species as that from which the active serum was

¹ Ann. de l'Inst. Pasteur, vol. xiii., p. 273.

obtained) causes in this animal the development of a globulicidal power in its serum. This globulicidal power develops from the meeting of the substance which is inherent in active serum with the alexin which the organism possessed previous to any intervention. 4. The specific antihematic substances which are characteristic of active serum, and which resist a temperature of 55°C ., fasten themselves energetically on the corpuscles they can attack. Lavage does not affect the property of agglutination and sensibility to alexin which the corpuscles have acquired from contact with the serum. Microorganisms behave in an analogous manner. 5. Alexins of different origins, which react similarly on the same microorganism (no matter from what animal taken), differ among themselves when their action on the red corpuscles is studied. Susceptibility of the red cells to the action of alexins of certain animals does not necessarily imply that they have become easily destructible by all alexins. 6. Antihematic serums also possess a well-marked antitoxic property; they can protect the corpuscles against agglutination and destruction by a fresh serum identical with that injected into the animals from which the active serum was taken. 7. With regard to the effect of heat, well-marked analogies exist between the active substances of the specific serums and those of the fresh serums which have similar properties. Heat (60° to 70°C .) weakens the power to agglutinate and to render the corpuscles susceptible to alexin. 8. Destruction by alexin is observed in corpuscles that have not been agglomerated. Agglomeration of corpuscles by a serum does not necessarily imply a sensitiveness to the action of its alexins.

The Bactericidal Substance of Leucocytes.—Schattenfroh¹ reports some experiments bearing upon the point made by Löwit,² that when leucocytes are ground up with powdered glass a bactericidal substance not destroyable by heat is set free. Schattenfroh had maintained that the substance might come from the glass, and had shown that when powdered glass is ground in physiologic salt solution, the solution becomes antiseptic for typhoid bacilli and streptococci. Löwit rejoined that it was the increased alkalinity of the solution which in Schattenfroh's experiments hindered the growth of the organism, and that in very favorable media the result would be negative. Schattenfroh now states that even in the most favorable media the solution is still bactericidal, and that the bactericidal power is removed by the careful addition of one-tenth normal hydrochloric-acid or sulphuric-acid solution. He does not believe that Löwit's substance comes from the cells, because if the latter are ground up with quartz sand bactericidal substances are not obtained. Schattenfroh's experiments were entirely negative; and he concludes that cells containing even the largest amounts of nuclein will not yield, when mechanically ground, a heat-enduring bactericidal substance.

Investigations on the Bactericidal Properties of Rabbits' Blood with Regard to B. Typhoid and B. Coli Communis.—P. Laschtschenko³ found that the bactericidal power of the blood on typhoid bacilli was sometimes so great that after 6 or 7 hours not a single colony developed; whereas under the same condition countless colonies of *B. coli communis* sprang up. This is such a constant occurrence in

¹ Münch. med. Woch., No. 35, 1898.

² Ziegler's Beiträge, Band 23.

³ Hyg. Rundschau, vol. ix., No. 3.

freshly prepared cultures of the *B. coli communis*, that it can be held characteristic and valuable in the differential diagnosis.

Werigo's¹ studies on the **immunity of the rabbit against anthrax** lead him to conclude that the bacteria injected are destroyed more energetically in the immunized animals than in the unimmunized. In the former case all the microorganisms are destroyed a few hours after injection; in the latter a few remain, which cause progression of the disease. The leukocytes in the immunized animals play a larger part in the struggle against the bacteria than in the unimmunized. This difference is most manifest in the lungs and spleen. The immunity of the rabbit against anthrax consists in an increase of the normal property of the leukocytes to surround and swallow the bacteria, as well as in the faculty of the organism to react more quickly against the bacterial invasion by the production of leukocytosis. In opposition to Metschnikoff, who holds that immunization is a change from negative to positive chemotaxis, the author holds the view that immunization consists in an augmentation of the sensibility of the leukocytes for the bacilli and their toxins. This property of quickly noticing the presence of the foreign invaders is but feebly developed in unimmunized animals. [This is an interesting and reasonable view, but in the end the relation must be one of chemic affinities. The importance of the leukocytes in immunity can be denied, and to some extent Metschnikoff's views are gaining ground. That phagocytosis, however, is the factor in immunity, is by no means proved.]

Formation of Toxin by Anthrax-bacilli.—Conradi² states that according to present methods the proof cannot be brought that the anthrax-bacillus forms an extracellular or an intracellular poison. From the experiments, it seems more probable that this bacillus does not produce toxins in the animal economy. It ranks as the type of an infectious microorganism.

W. Podwyssotzky and B. Taranonkhine³ have studied the **action on the anthrax-bacillus of lecithin**, known to be a powerful stimulant to animal and vegetable organisms. The culture-medium was calf's brains, triturated and made into a 20% emulsion by the addition of water, allowed to stand for 24 hours in a cool place, and then heated at 100° C. for $\frac{1}{2}$ hour; 5 gm. of salt, 16 gm. of gelatin, and 15 gm. of peptone were added; heat at 120° C. applied, the mixture filtered and poured into test-tubes, and again sterilized for $\frac{1}{4}$ hour at 115° C. Cultures of anthrax grown at 42°–43° C. appeared as more or less drawn-out filaments, sharply segmented, and with a distinct membranous envelope; the latter had a double contour and was shining and colorless. The filaments, which were changed into small rod-like bodies, separated by partitions and had a deeply-stained, shrivelled plasma, presented an atypical appearance, most marked when the culture was 3 to 4 days old. A well-marked Brownian movement was observed in these bodies as soon as water came into contact with them. The modifications are ascribed to plasmolysis, or dissolution of the albuminous plasma-layer which lies next to the membranous envelope, thus in some sort freeing the central bodies. After 3 to 4 days' exposure to a temperature of 42°–43° C., large numbers of spores appear, developed

¹ Arch. de Méd. expér., vol. x., p. 725. ² Zeit. f. Hyg. u. Infekt., vol. xxxi., p. 313.

³ Arch. de Méd. expér., 1898.

at the expense of the cell-protoplasm and set free by the gradual destruction of the membranous envelope (which takes no part in their formation). This mode of production of spores has not been observed before. The free spores stain a deep red; those not liberated, a clear pink. The Brownian movements are no longer visible after sporulation has occurred. These phenomena were only clearly observed when the culture-medium contained cerebral substance and peptone; consequently this new medium and a temperature of 42°–43° C. are recommended as best suited for the study of plasmolysis, the separation of the membranous envelope, and Brownian movements.

Further Investigations into Anthrax-immunity.—G. Sobernheim¹ has found it impossible to immunize rabbits successfully or permanently with sheep-serum against anthrax. The stage of passive immunity was very short and incomplete, the explanation for which seems to lie in some unknown peculiarities of the rabbits, and not in the amount of toxin used, the method or rapidity of inoculation or excretion of the poison. Experiments were next undertaken with 7 sheep. Whereas the 2 control-animals treated with normal serum died very promptly with typical lesions, the remaining 5 sheep, which had received single or repeated injections of anthrax-serum, were able to survive inoculation with the same virulent poison with only slight local or general reaction. After 2 to 2½ months these same sheep were again inoculated with a virulent anthrax-culture, and again survived. It would then seem that anthrax, the classic representative of *septicemic* diseases, may give rise to specific protective substances in the serum of animals which have reached a high grade of active immunity. But a direct action of these substances on the anthrax-poison does not occur as it does in the case of diphtheria, tetanus, etc. In connection with this, the absence of bactericidal or agglutinative properties of anthrax-serum, as compared with normal serum, must be noted. Experimental inoculations with a mixture of immune serum and anthrax-virus were readily supported in 8 cases (sheep), and conferred immunity against a second poisonous dose administered 3, 4, and 6 weeks afterward. This proves the combination of active and passive immunization in this manner to be harmless, and far superior in duration to immunization with plain serum, and therefore more available for practical protective inoculation. Finally, 6 sheep were fed with large quantities of anthrax-spores; they all survived, including 3 which had not been actively immunized, but had received 50, or 100, or 150 cc. of anthrax-serum within 24 hours of the experiments. The control-animals succumbed. This shows the possibility of the development of passive immunity against fodder-anthrax.

Results of Removal of Different Parts of the Brain on the Immunity of Pigeons Against Anthrax.—E. S. London believes that the resistance of pigeons to anthrax is abolished by the removal of the middle portions of both cerebral hemispheres. They are even more susceptible if the hemispheres are entirely removed. Since most of the animals survived the operation and were in good physical condition, he concludes that their loss of immunity must be ascribed to the modifications in the central nervous system resulting

¹ Zeit. f. Hyg. u. Infekt., vol. xxxi., pt. 1.

from the operation. In support of this is the fact that injection of an emulsion of cerebral substance did not restore to the mutilated animal the lost immunity, and that section of the spinal cord, with the resultant suppression of influence from the central nervous system, also rendered pigeons susceptible to anthrax.

Studies of Vaccinal Immunity.—Béclere, Chambond, and Ménard¹ find that the serum of a vaccinated heifer, 14 days after inoculation, possesses an antagonistic action on vaccine in the test-tube, since the vaccine-virus, after a bath in this serum, can no longer be inoculated successfully, and produces no local reaction, or next to none. In man and the horse, inoculation of vaccine also endows the serum with "antivirulent" properties. This "antivirulent" property of the serum is developed by vaccination, no matter by what channel the vaccine enters the system. The serum of variola-convalescents has this same property, as has also that of animals inoculated with smallpox. The "antivirulent" substance is of stable composition, resists the action of heat, light, moisture, and even of putrefactive agents, and supports for $\frac{1}{2}$ hour a temperature of 100° C. without losing its activity. It traverses porcelain filters, but does not dialyze, is precipitated by alcohol, and in its behavior resembles the diastases. Several days are required in man for the plasma to acquire this "antivirulent" property; in heifers 9 to 12 days are the average. The immunity following vaccination presents 2 phases: first, that in which the blood preserves its "antivirulent" properties, which, however, constantly decrease; the second, that in which it loses this power, though the skin still resists new inoculations. The "antivirulent" substance can traverse the placenta and give congenital immunity to the fetus. In the human subject, where immunity persists the longest, although varying much with the individual, the presence of this "antivirulent" substance can be recognized in the blood-serum more than 25, and even 50, years after vaccination or after an attack of variola. Some persons show it for only a few days, weeks or months after vaccination, or never show it. The production of this "antivirulent" substance in the course of variola or vaccination, and its appearance in the blood-plasma, constitute the organism's defensive reaction, and is intimately associated with the arrest of the morbid process and the production of immunity. It is not known whether it acts directly on the infectious agents, or if its effect is to stimulate the cells of the organism.

Contribution to the Study of the Action of Tetanus-toxin on the Nervous Tissue.—Danysz² finds that the cerebral substance of the guineapig has the power of attracting and fixing variable amounts of tetanus-toxin; this power is most marked when the cerebral substance has been emulsionized in normal salt solution. The fixation is not permanent. The toxin diffuses in the macerating fluids, and this diffusion is the more rapid according to the more or less energetic action of the fluids on the cerebral substance.

The Antitoxic Action of Carmin.—Stondensky³ finds by experiments on guineapigs that injection of carmin and tetanus-toxin does not produce tetanus. There is marked local reaction. The loss of the power to produce tetanus seems due to the swallowing of the carmin

¹ Ann. de l'Inst. Pasteur, vol. xiii., p. 81.

² Ibid., p. 156.

³ Ibid., p. 126.

grains and of the toxin at the same time by the leukocytes. Sterilization at 120°, 100°, and even 60° C. destroyed this property of carmin; but heating in closed tubes did not affect it. In the case of diphtheria-toxin the same phenomenon was observed. In both cases the toxin and carmin were injected under the skin in amounts equal to 10 fatal doses without producing any marked effect.

Gengon,¹ in experimenting with **infusoria** and **yeast-fungi**, finds them to possess a complete **natural immunity against tetanus- and diphtheria-toxins**, which exercise on them no chemotaxis, positive or negative. He argues that this natural immunity of unicellular organisms speaks in favor of the theory that the natural immunity of the higher animals results from an insensibility of the living cell to poisons. As regards the unicellular organisms, their immunity certainly does not arise from an antitoxic property of their blood nor from a rapid elimination of the toxins injected, since in the experiments made they were constantly in contact with the toxic medium. Behring calls this "histogenic immunity." [The results obtained with yeasts and infusoria cannot be directly applied to higher cells. Just as metabolism in general goes on in the former without blood-supply, so other functions, which in higher cells are resident in the blood or lymph bathing the cells, may be performed by the unicellular organisms.]

Agglutination of the Bacillus of Tetanus.—Courmont,² at a meeting of the Société de Biologie, December 3, 1898, reported that neither the normal serum of human beings, nor that of such susceptible animals as the mouse, guineapig, rabbit, and frog, nor that of more or less refractory animals, like the fowl and tortoise, causes any agglutination of the tetanus-bacillus. Horses' and asses' serum always agglutinates, but not in strength below 1:100. Neither spontaneous nor experimental tetanus develops any agglutinating property in the blood; hence the sero-diagnosis of tetanus is out of the question. Antitetanic serum is strongly agglutinating, acting even in the strength of 1:50,000. The injection of such serum does not, however, lead to the development of any agglutinating property, the agglutinating substance being destroyed in the organism. There is no relation between immunity or natural susceptibility to tetanus and the agglutinating power.

Immunity with Regard to the Bacillus Pyocyaneus.—Gheorghiewski³ states that in the course of pyocyanic infection, guinea-pigs show a degeneration of the leukocytes which are in contact with the bacteria, whether the animals are vaccinated or not. This same change can be demonstrated in the test-tube, and is not prevented by the serum of immunized animals. The agglutinating power of the serum appearing in the course of immunization shows no relation to the protective power of the same serum. The faculty of the *Bacillus pyocyaneus*, when grown in a purely albuminous medium, to produce a blue pigment, results probably from its peptonizing power. The serum of certain animals acquires in the course of immunization the property of preventing this peptonizing process. This property is not specific, and has no direct relation to the immunizing power of the serum nor to the resistance the immunized animal presents to the *Bacillus pyocyaneus*. The serum of

¹ Ann. de l'Inst. Pasteur, 1898.

² Sem. méd., Dec. 7, 1898.

³ Ann. de l'Inst. Pasteur, p. 298.

animals vaccinated against the *B. pyocyaneus* has in the test-tube no appreciable bactericidal properties. In immunized animals the destruction of the *B. pyocyaneus*, under the skin as well as in the peritoneal cavity, is accomplished in the interior of the leukocytes. Extracellular destruction could not be demonstrated. All the animals, normal and immunized, exhibited their resisting power to the *B. pyocyaneus* by phagocytic reaction. The immunizing serum favors the appearance of this reaction.

Phagocytosis in the Pigeon Infected with Avian and with Human Tubercle-bacilli.—Dembinski¹ believes that the phagocytic reaction in the pigeon is different according as the one or the other bacillus is injected. When the avian bacillus is injected, phagocytosis is very active. It is first polynuclear, then mixed, and finally mononuclear. Inoculation with the human tubercle-bacillus causes from the start a mixed leukocytosis of mononuclear and polynuclear cells. Phagocytic phenomena are rarely observed, but the mononuclear cells tend to encircle the bacilli, and at the end of 24 hours their heaping together and fusion create genuine giant cells, the number of which constantly increases. The giant cells thus exercise a more powerful phagocytic action than the isolated leukocytes. The leukocytosis is powerless to arrest the disease-process when avian bacilli have been injected.

Besredka² finds the leukocytes are able to take up toxic substances which have not been attenuated by the fluids of the body. The **trisulphid of arsenic** is active as a poison in so far as it is soluble. This solubility, when the substance is injected into the peritoneal cavity, is arrested by the phagocytic intervention, whence the relative immunity of the animal toward this salt in aqueous solution. The phagocytosis does not consist simply in chemotaxis and the taking up of the trisulphid, but also in a sort of digestion of it, in which it is decomposed into a soluble compound. From further experiments with arsenious acid he finds a stage of hypoleukocytosis to follow the injection of this poison, which persists till death or is replaced by a hyperleukocytosis. If the animal dies within 24 hours a marked hypoleukocytosis comes on 1 hour after injection. The polynuclears are much reduced in number; almost all the leukocytes are small mononuclear. If the animal survives indefinitely a hypoleukocytosis develops, which is proportionate in degree and duration to the dose and the individual resistance of the animal. This phase yields gradually to a hyperleukocytosis coinciding with the animal's recovery. In this case, even from the first there is a tendency for the polynuclear cells to be in excess, which becomes most marked with the onset of hyperleukocytosis. When the animal only survives a short time, there is first a marked hyperleukocytosis next an abortive hyperleukocytosis, and last a fatal hyperleukocytosis as before. Chemie analysis of the leukocytes in the different cases shows that these contain arsenic only during the stage of hyperleukocytosis in which the animal survives. There is then a phagocytosis of the same character for soluble poisons as for microorganisms or insoluble poisons.

The Role of the Leukocytes in Immunization Against Soluble Arsenious Acid.—Besredka³ finds that by accustoming the leukocytes to its presence, rabbits can be immunized against a fatal dose of ar-

¹ Ann. de l'Inst. Pasteur, vol. xiii., p. 426.

² Ibid., pp. 49 and 209.

³ Ibid., p. 465.

senious acid. This result is brought about by giving fractional doses, or by injecting first a preventive dose, and then, after 24 hours, a fatal dose. The serum of the immunized animals possesses preventive and antitoxic properties against a quantity of arsenious acid which kills in 48 hours. Antiarsenin is probably a nonarsenical compound, and the arsenic found with it is undialyzable and of cellular origin. Antiarsenin acts through the leukocytes. [These experiments are of value, if their results are corroborated, in that they give some explanation of the tolerance to poisons.]

Experimental Study on the Result of Introducing Toxins and Antitoxins into the Intestinal Tract.—Carrière¹ introduced tetanus-toxin and snake-venom through a soft catheter into the stomachs of rabbits, in doses several hundred times greater than the fatal dose by injection, without causing any toxic effects. The serum of these animals was not antitoxic, nor did its injection confer immunity. In the intestinal tract, after ligation of the rectum, no trace of toxin or venom could be demonstrated. Experiments with the digestive juices showed: 1. Ptyalin completely destroys the activity of tetanus-toxin and snake-venom. 2. Artificial gastric juice in large proportions destroys or attenuates these poisons. 3. Bile has the same effect, but a considerable quantity is needed. 4. Pancreatin manifestly attenuates, without destroying, the tetanus-toxin, but in larger amounts can destroy it. Even small amounts of pancreatin destroy the activity of the snake-venom. Neither the intestinal epithelium nor the intestinal bacteria destroy tetanus-toxin or snake-venom. At most they attenuate them slightly. The leukocytic oxydases in large quantities attenuate, without destroying, these poisons. With regard to antitoxins injected into the intestinal tract, the following results were obtained: Ptyalin, bile, and gastric juice had almost no action on antitetanic and antivenomous serums. Pancreatin and the intestinal bacteria exercised a marked influence; the former can destroy them. Intestinal epithelium seemed to destroy them; while the oxydases did not affect them.

Research into the Neutralizing Property of the Bile with Regard to the Virus of Rabies.—H. Vallée² experimented to verify the claims of Frantzius that the bile of animals which die from rabies has an antitoxic power, and found, as the result of inoculations carried out on 60 rabbits (subcutaneous, intraocular, and intracranial injections of bile and rabies-virus) that: 1. The bile of rabbits dead from rabies contains no antitoxin against rabies. 2. Rabbits' bile plays an active part as an antiseptic when mingled with rabies-virus. In a few moments a virulent emulsion is neutralized by an equivalent amount of bile. 3. Inoculation of a mixture of equal parts of rabies-virus and of the bile of a rabbit dead from rabies or of the bile of a healthy rabbit, does not kill the animals nor does it immunize them.

Fasting and the bactericidal action of the blood are considered by S. I. Meltzer and Charles Norris.³ The results of 5 experiments with dogs showed conclusively that 5 days' fasting did not affect in the slightest degree the bactericidal power of the blood, as tested with the typhoid bacillus.

¹ Ann. de l'Inst. Pasteur, vol. xiii., p. 435.

² Centralb. f. Bakt., Parasit. u. Infekt., vol. xxiii., p. 782.

³ Jour. Exper. Med., vol. iv., p. 131.

Bacteriolytic Enzyme the Cause of Acquired Immunity.—

Rudolf Emmerich and Oscar Löw¹ believe that the gradual arrest of development of bacteria in most fluid culture-media, notwithstanding the presence of sufficient and proper pabulum for their growth, depends on the development of enzymes, which are created by the bacteria themselves, and finally dissolve them. Some of these enzymes have also the power to dissolve other (including pathogenic) bacteria. Recovery after the use of "metabolism-products," or unfiltered cultures of bacteria, depends on the presence of bacteriolytic enzymes in the cultures. Artificial immunization with so-called "metabolism-products," or unfiltered cultures of pathogenic bacteria, depends on the fact that a more stable combination is gradually developed in the blood between the bacteriolytic enzyme of the bacteria and an albuminous body in the blood or with organic albumin. The immune *proteid* resulting still possesses the bacteriolytic properties of the original enzyme. The same reaction can be brought about chemically in the test-tube in a much shorter time and with less loss of enzyme. Agglutination is nothing more than the first stage of the bacteriolytic action of the enzyme. Immunizing serums act, as a general rule, much more energetically as bactericides when air is excluded, a point not hitherto emphasized. Some bacterial enzymes—*e. g.*, that of *B. pyocyaneus*—have not only a destructive power on bacteria, but also on toxins. *B. pyocyaneus* can completely neutralize diphtheria-toxin. A 14 days' immunity against anthrax can be produced by the action of pyocyanous immune proteid in prepared in the test-tube. The bactericidal power of normal blood is probably also due to a substance resembling enzymes, since normal blood in high concentration possesses the power of agglutination.

W. H. Park and J. P. Atkinson² contribute a valuable article on the **toxicity and neutralizing value of diphtheria-toxin**. Ehrlich claims that the toxin of diphtheria is only at its origin a definite chemie compound, with definite antitoxic properties; that it soon loses its toxicity, while its affinity for antitoxin may be either increased or decreased. The authors' experiments agree with this theory. They find the neutralizing value of a fatal dose of toxin is at its lowest in the culture-fluid when the first considerable amounts of toxin have been produced. After a short period, during which the quantity of toxin in the fluid is increasing, the neutralizing value of the fatal dose begins to increase, at first rapidly, then more slowly. While the culture is still in vigorous growth and new toxin is being produced, the neutralizing value of the fatal dose fluctuates somewhat, but with a general upward tendency. After the cessation of toxin-production, the neutralizing value of the fatal dose increases steadily, until it becomes 5 to 10 times its original amount. In the fluid holding the live bacilli, after the first few hours of toxin-formation, a double process occurs: one of deterioration in the toxin already accumulated, which tends to increase the neutralizing value of the fatal dose; the other, of new toxin-formation, which tends probably to diminish the neutralizing value. Later, with the period of cessation of toxin-production the gradual deterioration of the toxicity alone continues, and the fatal dose gradually and steadily increases in its neutralizing value. Ehrlich's theories as to the splitting up of "toxin" into

¹ Zeit. f. Hyg. u. Infect., vol. xxxi., pt. 1, p. 1. ² Jour. Exper. Med., vol. iii., p. 529.

"toxoids" having little or no toxicity, but full neutralizing power for antitoxin, have not been substantiated by these experiments. The authors feel certain that Ehrlich's formula for standardizing toxins is founded upon error, and cannot be employed for the purpose he intended.

S. Arloing and Paul Courmont,¹ in studying the **agglutination-reaction of tubercle-bacilli**, find the best culture-medium to be beef- or veal-bouillon with 1 % peptone and 6 % glycerin, sterilized as briefly as possible at 110° C. Rich cultures, 8 to 10 days old, are the most favorable for the reaction. In the great majority of cultures the agglutinating substance increases up to about the fifteenth day, after which it diminishes gradually or loses some of its properties. Certain precautions should be observed. Fresh serum from the finger, free from blood-pigment, must be used. The proportions to be employed are, 1:5, 1:10, 1:20 drops of the culture-medium, which should be contained in sterilized tubes of small diameter. These, as soon as the serum has been added, are held at an angle of 45° to aid sedimentation. Outside of these proportions agglutination does not occur, or has no practical significance. The time required varies. At the end of 24 hours, if clarification is complete, the reaction is absolutely positive; the authors consider it also definite when, notwithstanding slight turbidity, there is an abundant deposit of well-formed clots. For a control-test they use the serum of a tuberculinized animal, or of a pleural or peritoneal effusion, which can be readily kept and has a known power of agglutination. Clinical tests gave positive results in 92 % of 26 advanced cases of pulmonary tuberculosis, in 95½ % of 22 cases of less advanced pleural and pulmonary lesions; out of 12 surgical cases of tuberculosis, 6 reacted well and 6 feebly. In 21 patients diversely affected, the reaction was negative 14 times and feebly positive 7 times; while 16 healthy young adults furnished 5 positive results. [The fact that the reaction was obtained in 5 out of 16 healthy individuals greatly lessens its clinical value.]

Felix Mesnil² has obtained, by vaccinating rabbits according to the Pasteur method, a serum which is antiinfectious against **rouget de porc**. This serum can be utilized to immunize mice, and will cure them if introduced within 24 hours of infection. It has strong agglutinating power with marked dilutions, but the microorganisms lose none of their virulence.

The Mechanism of Agglutination.—Bordet³ rejects as insufficient the theories explaining agglutination as a result of swelling, or viscosity of the bacteria, or from the formation of a precipitate in the body of the liquid. Since agglutination occurs with most diverse elements (red corpuscles, microbes, casein), the same explanation should hold good for these different cases. Agglutination may fairly be described as a modification of the molecular attraction which unites the agglutinable substances with each other or the surrounding fluid. There are two phases, of which the first can be produced experimentally without provoking the second stage. In the former the particles still possess their natural properties; in the latter they obey molecular forces, and may present peculiarities in their agglutination which occur in the case of mineral particles. The phenomena of agglutination are very similar to those

¹ Ann. de l'Inst. Pasteur, 1898.

² Ibid.

³ Ibid., vol. xiii., p. 225.

of coagulation, and can be produced in clear fluids where the particles are very finely divided. With regard to their power to cause solution and coagulation, active serums can be compared to the digestive juices. Immunity will come to be considered, even from the chemie point of view, as a special instance of the physiology of digestion.

Marmorek's Serum.—Bonne¹ reports a case of cure from the use of antistreptococcic serum. He himself was the patient, and he believes that his life was saved by it. It was the only treatment employed. Raw² reports 11 cases in which the serum was used, with 6 recoveries and 5 deaths. One of the fatal cases was found to be a staphylococcus- and colon-infection. The author believes that in cases of pure streptococcus-infection the serum is valuable. Ramsay³ reports the case of a young girl of 14, with general sepsis (pyemia, abscesses in joints, miliary abscesses, etc.). Altogether, 205 cc. of the serum were injected. After 5 weeks the patient was almost cured. The patient thought that her appetite improved and that she slept better from the beginning of the injections. When they were left off she was worse. Streptococci had been found in the blood. [In practically all of the recoveries reported under the use of antistreptococcic serum a strong doubt as to the influence of the latter is justifiable. In Ramsay's case and in others the long duration, together with the fact that abscesses broke out here and there during the administration of the serum, renders it probable that the serum had not much to do with the recovery, and that the patients would have got well without it.]

Remlinger,⁴ from a study in rabbits and guineapigs on **hereditary transmission of acquired immunity against the typhoid bacillus**, concludes that the role of the father is negative, but the mother's positive, especially if immunization has been carried out during gestation. Even in these conditions the immunity conferred is short and fugacious, enduring a month or two at most, and does not extend to the next litter. Suckling does not confer immunity. With regard to transmission of the power of agglutination, the father's role is negative and the mother's positive if immunization occurs during gestation. It is much weaker in the fetus than in the mother, and does not persist more than several months; it is not transferred by suckling. [These observations are in line with Ehrlich's views and those of Vaillard.⁵ They furnish an argument to the believers in Weismannism—the noninheritance of acquired characters.]

The Passage of Toxic Substances from the Fetus to the Mother.—Baron⁶ and Castaigne, from experiments made on guineapigs, on a bitch, and on the human fetus, conclude as follows: 1. Substances injected directly into the fetus or the amniotic sac pass rapidly into the maternal organism if the fetus is alive, more quickly if the injection is into the fetus. It seems certain, then, that if the fetus secretes toxic substances which are in circulation in its blood or the amniotic fluid, these would pass over to the mother; the possibility of an eclampsia of fetal origin is thus demonstrated. 2. When the fetus is dead, substances injected into the amnion or fetus do not reach the mother's blood. This

¹ Therap. Monatsch., No. 9, 1899; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 262.

² Lancet, July 9, 1898.

³ Ibid., Oct. 22, 1898.

⁴ Ann. de l'Inst. Pasteur., vol. xiii., p. 129.

⁵ See YEAR-BOOK for 1897, p. 727.

⁶ Arch. de Méd. expér., vol. x., p. 693.

explains clearly how the death of the fetus can put an end to various complications of pregnancy, especially puerperal convulsions.

Van Emden¹ has attempted to find the **place of formation of the agglutinating substance** in experimental infection with the *Bacillus aerogenes*. He found that, in the first few days following the inoculation, the agglutinins were present in the spleen in larger amounts than in any other organ, even than in the blood. As, after the injection into an animal of serum rich in agglutinins, the spleen did not store the agglutinating substance to any extent, the conclusion is drawn that the large amount found in the spleen after the injection of the bacteria is due to a production of the substance by that organ. The freshly-formed agglutinins are gradually taken up by the circulating blood, and stored there, so that, in time, the content of the blood is greater than that of the place of formation. He then studied the formation of agglutinins in animals deprived of the spleen, and found that they were produced in fair quantity. Hence other organs besides the spleen must possess the power of elaborating agglutinins, and it was shown that the bone-marrow and the lymph-glands had this power, as well as the liver, kidney, and lung. The production was greatest in the lymphoid tissues.

Augmentation of the Toxin-production of the Diphtheria-bacillus through Symbiosis with the Streptococcus.—Paul Hilbert² calls attention to the fact, noted also by others, that the toxin-production of the diphtheria-bacillus in bouillon-culture is extremely variable; usually it appears in from 1 to 3 weeks, at times as early as the first day, sometimes not until the sixth month, and occasionally not at all. The cause of this variability, which may be presented by bacilli from the same stock, is to be found in the nature of the nutrient medium. Abundance of sugar is unfavorable, marked alkaliescence favorable to toxin-production. The latter—*i. e.*, toxin-production—also occurs earlier after surface than after deep inoculations. The value of the passage of air over the cultures is questionable. Hilbert himself has studied the influence of symbiosis of the diphtheria-bacillus with the streptococcus on toxin-production. He found, first, that when the two are growing together the bouillon becomes more rapidly alkaline, and the alkalinity reaches a higher degree than in pure cultures of the diphtheria-bacillus. Secondly, the toxin-production runs parallel with the alkalinity; both, however, are, as in pure cultures, somewhat variable. As to the causes leading to earlier and stronger toxin-production under those circumstances, 3 possible explanations exist: 1. The diphtheria-bacilli grow more luxuriantly in association with streptococci. 2. The streptococci produce a change in the culture-fluid that is favorable to toxin-production on the part of the diphtheria-bacillus. 3. The virulence of the bacilli is increased through symbiosis. The first is possible, but plays probably no great part. The second—the change in the culture-media—is not a factor; the streptococcus tends to produce an acid, and this, by lessening the alkalinity, diminishes the toxin-production. The last theory is the most likely one of all. The increased toxicity of the mixed culture is not due to a “mixed toxin”; the toxin has all the properties of the pure diphtheria-toxin. The bacilli during symbiosis undergo a change by which they are

¹ Zeit. f. Hyg. u. Infectiouskr., Band 30, Heft 1.

² Ibid., Band 29, Heft 2.

stimulated to increased toxin-production—in other words, their virulence is intensified. In practice, we must combat the increased virulence of the diphtheria-bacillus when associated with the streptococcus by the use of larger doses of antitoxin, and must guard against a secondary infection with streptococci by the earlier employment of the antitoxic serum.

Serodiagnosis of Psittacosis.—An increasing number of infectious diseases is coming within the range of exact diagnosis through the medium of the specific reaction of the serum on the pathogenic microorganisms. One of the most recent additions to the series of diseases thus diagnosable, is psittacosis, an infectious disease occurring in birds, particularly in parrots, and transmissible to man. In the avian family the symptoms are diarrhea, wasting, loss of appetite, and falling out of feathers. In man the disease runs the course of a grave typhoid fever, with diarrhea and marked pulmonary symptoms; usually there is a spreading pneumonia. The cause of the disease is probably a bacillus, discovered by Nocard, which resembles somewhat the bacillus of typhoid fever. Nicolle¹ reports an epidemic of psittacosis attacking 8 persons, 4 of whom succumbed. The source of the disease was a sick parrot. The author was unable to isolate Nocard's bacillus from any of the cases, but obtained a typical agglutination of a culture procured from Nocard. In 1 patient the serum agglutinated the bacillus on the eighth day of the disease, in strength of 1:50; on the following day, during the agonic period, in strength of 1:60. In another, the reaction was absent on the sixth day, but appeared on the eleventh day. The blood of a third patient, convalescing from a mild attack, had no agglutinating power. Nor did that of the parrot show any such power on the fifteenth day after recovery. The blood of one patient, although he had never had typhoid fever, reacted also with the typhoid bacillus, and the serum of all animals inoculated with cultures of the psittacosis-bacillus has some influence on the typhoid germ, a fact that is explained by the great similarity of the two microorganisms.

TECHNIC.

The Effect of Romanowski's Stain on Bacteria.—Zettnow² states that the best methylene-blue for Romanowski's double stain (methylene-blue and eosin) is the medicinal methylene-blue of the Höchst Farbwerke. But any preparation will answer, provided it is treated in the following way: 1. To 100 cc. of a 1% solution of crystals with a green reflex, 4 cc. of normal sodium-hydrate solution are added. The mixture is allowed to stand 3 or 4 hours at from 20° to 25° C., and then 4 cc. of normal solution of hydrochloric acid are added. 2. The crystalline dyes with reddish-violet reflex—*i.e.*, the zinc-chlorid double salts—require double quantities of the aforementioned additions. At the time of using, from 1 to 4 drops of a 5% solution of crystallized soda are added to each cc. of methylene-blue solution. To prevent mould-formation, Zettnow adds to 500 cc. of the methylene-blue solution 5 cc. of a solution of thymol in alcohol (1:10). The eosin used by Zettnow is bromin-eosin

¹ Compt. rend. des Sci. de la Soc. de Biol., Dec. 30, 1898.

² Zeit. f. Hyg. u. Infectiönskr., Band 30, Heft 1.

B A extra of the Höchst works, in 10% solution. As differentiating solution, he employs, for blood, a solution of methylene-blue (2) in water (400), and glacial acetic acid (1 cc.); for bacteria, a solution of eosin (1:500), or a solution of methylene-blue (1:10,000), or the 1 first given. In preparing the double stain, 2 parts of methylene-blue and 1 part of eosin are used. The cover-glass film is stained for from 2 to 5 minutes, then washed with water, and then, for blood-preparation, with the acetic-acid and methylene-blue solution; for bacteria, 2 to 6 times with the eosin-solution, followed by counterstaining with the 1:10,000 methylene-blue solution. Using this method, Zettnow was able to recognize in many bacteria a red-staining part—"chromatin"—and a blue-staining "plasma." A large number of bacteria consist only of chromatin; in the others the chromatin, for the most part, predominates, but in some very young cultures the plasma exceeds the chromatin in amount. The red-staining substance is probably the nucleus; the blue-staining portion the author designates "entoplasm"; and that plasma of bacteria which is only stainable after previous mordanting—*e. g.*, the flagella and capsule—he terms "ectoplasm." The results of the double-staining of 102 species of bacteria are given.

A New Preparation for Rapidly Fixing and Staining the Blood.—Louis Jenner¹ states that he mixes equal parts of from 1.2 to 1.25% solution of Grüber's water-soluble eosin, yellow shade, in distilled water, and a 1% solution of Grüber's medicinal methylene-blue, also in distilled water. The mixture is thoroughly strained in an open basin, not in a flask. It is next filtered, and the residue is dried either in the air or more quickly in an incubator. When quite dry the residue is scraped off the filter-paper, and is powdered. It is then shaken up with distilled water and washed on the filter. Finally, it is again dried and powdered, and may be stored in suitable bottles. For use, 0.5 gm. of the powder is thoroughly shaken in 100 cc. of pure methyl alcohol and then filtered. The solution keeps well. As soon as the film is dry, a few drops of the solution for fixing and staining are poured on, no previous fixation being required. The cover glasses should be absolutely clean, and should have no trace of acid or alkali on them. After they have been cleaned and washed in distilled water, they should be kept in absolute alcohol only. The specimen is covered with a watch-glass to prevent evaporation. In from 1 to 3 minutes the stain is rapidly poured off, and the specimen is at once rinsed in distilled water. It is then dried, and is mounted in xylol-balsam. The red corpuscles are of a terra-cotta color, the leukocytes are blue, the plates are mauve.

A New Blood-stain.—L. H. Prince² recommends the following mixture for the staining of blood: Saturated solution of toluidin-blue (Grüber), 24 parts; saturated solution of acid-fuchsin, 1 part; 2% solution of eosin, 2 parts. The solution should be made in distilled water, mixed in the order given, and the mixture agitated thoroughly for a few minutes. Only the supernatant fluid is to be employed. The mixture is ready for immediate use after agitation, and from 20 to 30 seconds are quite enough to stain. At the end of 10 or 12 weeks, from 5 to 7 minutes are required to get a good result. The spreads should be fixed in dry air at a temperature of 120° C. for at least 20 minutes. The solution is

¹ Lancet, Feb. 11, 1899

² Phila. Med. Jour., Dec. 24, 1898.

allowed to remain on the cover-glass generally for from 1 to 3 minutes. The cover-glass is then washed in running water and quickly dried in the air. When dry, it is passed 2 or 3 times through a Bunsen flame, and then mounted in balsam. The mixture stains the nuclei, neutrophilic granules, eosinophile granules, and the plasmodium of malaria.

Sudan III. a Selective Stain for Fats.—Nicholls¹ confirms Rieder's⁴ observations as to the value of sudan III. as a stain for fat. He uses either Zenker's fluid or, preferably, a 7 % formalin solution. This hardens in 1 or 2 hours, and the specimens can then be cut on a freezer. They are stained in sudan III., made according to the formula of Rieder: 96 % alcohol saturated with sudan III., filtered, and diluted two-thirds with 50 % alcohol, and again filtered. Sections are placed in this for a few minutes, then repeatedly washed in 60 % alcohol, and mounted in Farrant's fluid. Bacteria are not tinged by the dye. Myelin is slightly tinged by it, although by no means to the same degree as fat. The granules of cloudy swelling do not take the stain. Eosinophile and neutrophile granulations are also-not stained.

A Simple Method of Preparing Alkaline Albumin for Culture-mediums.—Sailer² prepares an alkaline albumin, not coagulable by heat, after the following method: About 100 parts of egg-albumin are taken, the yolks being carefully separated, and to this about 10 cc. of strong ammonia are added. The mixture is thoroughly stirred and tested with litmus-paper, in order to be sure that the reaction is strongly alkaline. It is then diluted with water to 1000 parts. The solution may now be boiled, water being added to supply the loss by vaporization, until enough of the ammonia is evaporated to reduce the reaction to the production of a faint bluish tinge upon red litmus-paper, indicating a degree of alkalinity similar to that generally employed in cultures. It may then be distributed into tubes and used as a liquid medium, or gelatin or agar may be added to form a solid medium. Sterilization is best accomplished in the steam sterilizer. Sailer has succeeded in growing the *Bacillus anthracis*, the bacillus of Friedländer, the colon-bacillus, and the *Bacillus prodigiosus* on this medium, but not the typhoid bacillus nor the *Bacillus pyocyaneus*. He is inclined to think that this alkaline albumin may replace the ordinary bouillon as stock-solution, and that glycerin or glucose can be added to it, as to ordinary bouillon.

Staining of Flagella.—Stephens³ has modified Van Ermengem's method of staining flagella by substituting for the silver nitrate one of the new silver albuminates—largin. The cover-glass should be burned on a piece of wire gauze, to remove all fat. The solutions employed are: 1. Osmic acid, 2 %, 1 part; tannin, 10 % to 25 % solution, 2 parts; to each 100 cc. add 4 or 5 drops of glacial acetic acid. 2. Gallic acid, 5 gm.; tannin, 3 gm.; fused sodium acetate, 3 gm.; water, 350 cc. 3. A 2 % largin solution. The time for remaining in the different solutions varies; the cover-glass may be passed back and forth between the gallic acid and the largin solution until the proper staining is obtained.

¹ Phila. Med. Jour., July 2, 1899.

² YEAR-BOOK for 1899, p. 707.

³ Phila. Med. Jour., Oct. 22, 1898.

GENERAL MORBID PROCESSES.

Pathologic Lipogenesis.—Lindemann¹ remarks that the separation of fatty processes into infiltration and degeneration is gradually becoming very vague. Fatty degeneration has always been defined as a conversion of the cell-protoplasm into fat, and infiltration as a deposit of fat introduced into the cell from without; but it has been proved that fats can be formed from carbohydrates, and that this occurs in the cell. This mode of fat-formation cannot belong either to infiltration or to degeneration, though it is usually classed with the former. An attempt has been made to substitute for the vague term infiltration that of *transport*—i. e., of the conveying of fat from the fat-depots to the cells. Lindemann divides the possible modes of the accumulation of fat in cells as follows: I. *Formation of fat from albumin*: 1. In the living cell—(a) From the albumin of the paraplasm; (b) from the albumin of the protoplasm proper; (c) from the albumin of the surrounding fluids. 2. In the dead cell—(a) Through a fermentation-decomposition of the albumin; (b) through the activity of bacteria. II. *Formation of fat from carbohydrates*: 1. From the carbohydrates of the cell. 2. From the carbohydrates of the tissues of the body—(a) From the carbohydrates of the food; (b) from the carbohydrates of the liver and muscles; (c) from the carbohydrates split off from the albumin. III. *Formation of fat from the lecithin of the cell*. IV. *Conveyance of the fat already formed from the fat-depots to the cell (transport)*. V. *Ingestion of the food-fat by the cells of the body*. VI. *Phagocytic ingestion of the fat with the formation of granule-cells*. With the exception of the granule-cell, in none of these modes is there really an infiltration of fat in the old sense. Even the fat of the food undergoes a change during its deposit. Those forms of intracellular fat-accumulation in which neither fat nor its components are brought to the cell may be designated as *endocellular lipogenesis*, in contradistinction to *extracellular lipogenesis*, in which a transport occurs, and which is again divisible into an alimentary and a phagocytic form. Endocellular lipogenesis may provisionally be divided into (1) *physiologic*, (2) *degenerative*, and (3) *postmortal* lipogenesis. Physiologic lipogenesis is characterized by the absence of marked disturbances in the function and the structure of the cells. The cell, as in the case of the mammary gland, must possess the power of recuperation. In degenerative lipogenesis the fat is formed out of an integral part of the cell; the structure of the cell is markedly altered. To assume that such a lipogenesis occurs, it is first necessary to prove that fat can be formed out of proteids, a possibility denied by Pflüger. It has been demonstrated that fat can be formed from proteid through bacterial agency, as in the case of adipocere and in the maturation of cheese. But fat can also be formed outside of the body without bacterial influence; fatty changes take place in dead tissues kept under aseptic conditions. Lindemann then takes up the subject of endocellular and extracellular lipogenesis in detail. Endocellular lipogenesis is demonstrated in the fattening of animals by feeding them on carbohydrates—the fat can only be formed through a synthetic action of the cells. But,

¹ Ziegler's Beiträge z. path. Anat. z. u. allg. Path., Band 25, Heft 2; Univ. Med. Mag., June, 1899.

besides carbohydrates, lecithin and albumin must be considered sources of fat. The lecithin is probably an antecedent of the fat in cases of fatty degeneration. Among the proofs of the formation of fat out of albumins are mentioned: 1. The secretion of milk. 2. The formation of fat from albumin during feeding with fat. 3. Fatty degeneration. 4. The formation of fat in phosphorus-poisoning. 5. The formation of adipocere. 6. The formation of fat in the ripening of cheese, etc. Two of these (5 and 6) have no weight, as bacteria are probably concerned in the process in both cases. Regarding 2, it has been proved by Munk and by Rosenfeld that foreign fat introduced into the organism is deposited unchanged. Only 3 remain as evidence—milk-production, fatty degeneration, and phosphorus-poisoning. Rosenfeld¹ maintained that the milk-fat was none other than the fat introduced and stored in the fat-depots. A slut fed with mutton-tallow secreted milk containing mutton-tallow, and not dog-fat. But Lindemann holds that if Rosenfeld's contention, that the milk-fat is nothing else than body-fat, were correct, then there should be no difference between the fat of butter and the tallow of cattle. But there is a marked difference, butter containing a vastly larger quantity of volatile fatty acids. Regarding fatty degeneration, the existence of this process has been entirely denied by Rosenfeld, who believes the fat is brought from the fat-depots of the body, and who found that in starved hens fatty degeneration of the liver did not occur after phosphorus-poisoning. Lindemann repeated these experiments in pigeons, and found that fatty degeneration of the liver occurred in the starved bird poisoned with phosphorus in no less degree than in the pigeon fed as usual. Rosenfeld had also noted that in animals which had been fed with mutton-tallow, phosphorus-poisoning produced a fat-deposit in the liver; this fat, however, consisted of mutton-tallow, not of dog-fat. Lindemann admits that there is an infiltration of fat, a transport from the fat-depots, in phosphorus-poisoning; but contends that there may be a degeneration as well. The possibility also remains, as suggested by Pflüger, that the fat taken up is utilized to regenerate the albumin. Finally, if it is ever proved that phosphorus does not produce fatty degeneration, that is then true only of phosphorus, and must be proved for other pathologic processes. Extracellular lipogenesis—*i. e.*, that in which the fat of the food or that given to the blood by the fat-depots of the body is deposited in certain cells—is not a simple process, but a complicated synthesis, which for its performance requires healthy cells. Lindemann showed that if the renal epithelium was injured by poisoning animals with chromic acid, and phosphorus was afterward given, fat was deposited practically only in cells, the nuclei of which were free from damage. This, then, would indicate a transport of fat, and also that diseased cells cannot take up fat. But when oleum pulegii was given to animals that had previously received chromic acid, the diseased renal cells—except those completely necrotic—were filled with fat-granules, which goes to prove, the author holds, that while fatty infiltration requires a healthy cell, diseased cells can undergo fatty degeneration. Degenerative lipogenesis is accompanied by certain characteristic changes in the nuclei of the cells, which resemble those that have been described as pyknosis.

Alonzo Engelbert Taylor² describes a series of experiments to show the

¹ Univ. Med. Mag., vol. ix., p. 853.

² Jour. Exper. Med., vol. iv., p. 399.

origin of fat from protein in the so-called fatty metamorphosis of phosphorus-poisoning. Frogs weighing collectively 588.780 gm., all of the same sex, of the same comparative approximate weights, taken from the ground about the same time, kept awake and without food for nearly the same time, were divided into equal groups: the one group was poisoned with phosphorus; the other held as control. The frogs in the poisoned group lost in dried residue 8.821 gm., or 16.5% of the dried residue of the control-group; 1.182 gm. of nitrogen, corresponding to 7.388 gm. of proteid, or 18.45% of the nitrogen and protein in the control-frogs; 1.026 gm. of fat, or 22.64% of the fat in the control-animals; and 0.261 gm. of glycogen, or 13.3+ % of the glycogen in the control-frogs. Taylor finds it obvious that in these experiments no fats were produced from protein; nor was fat formed as the result of phosphorus-poisoning. The so-called fatty degenerations which occurred in these frogs did not comprehend any formation of fat at all, but simply the deposition of fat. Athanasin arrived at the same conclusions with regard to the essential point, that no fat was produced by phosphorus-poisoning; but his poisoned animals lost only glycogen, while Taylor's lost fat and protein as well. Taylor thinks the results to be due to the varying conditions under which the animals were kept.

Ludvig Hektoen,¹ discussing **the fate of giant cells**, states that the giant cells found in the absorption of coagulated blood-serum inserted into the anterior chamber of the rabbit's eye subdivide again into uninuclear, small cells, that take part with other newly formed cells derived from the lining of this space to form a densely fibrillated mass of tissue that resembles quite closely the cornea in its structure. This strengthens the writer's opinion that the giant cells in healing nondegenerated tuberculous tissue may separate into small living cells; and that the giant cells of tuberculosis are not necrobiotic elements from the moment of their formation, as the Germans teach.

Herbert U. Williams, in an effort at the production of **experimental fat-necrosis**, used 13 cats for the subcutaneous introduction of pancreas into the adipose tissues in 24 places. At 9 points fat-necrosis ensued; in 9 there was none; in 6 the result was doubtful (suppuration was present). At 11 points there was infection; at 11 points no infection; at 2 doubtful results. In the 13 with doubtful and without infection fat-necrosis occurred at 8 points, but was absent at 5. Microchemic tests (when they could be employed) gave the reactions characteristic for fat-necrosis, including sometimes the demonstration of calcium salts. The histologic appearances were practically identical with those observed in peritoneal fat after ligation, laceration, and other operations on the pancreas.

In an article on **caseous degeneration**, Jules Auclair² draws the following conclusions: By the action of ether, xylol, benzin and chloroform a fatty substance is dissolved out of tubercle-bacilli, which causes a marked local reaction, and is the principal, if not the only, factor in the suppuration and caseation they produce. This caseating poison is secreted in greater or less quantity according to the conditions in which the bacilli live and their grade of development; and varies in the organism according to the individual reaction. It is likely to be secreted in great

¹ Jour. Exper. Med., vol. iv., p. 577.

² Rev. de Tuberculose, vol. vi., p. 97.

quantity in cases in which the bacilli reproduce slowly. This explains why, clinically and experimentally, tuberculous processes of slow development and with little tendency to heal are ordinarily those in which the local processes are the most important and the caseofibrous masses the most abundant.

Petrone¹ has investigated **experimental amyloid degeneration**. He reviewed the work of Krawkow, and repeated the latter's experiments, inoculating 7 rabbits with virulent cultures of *Staphylococcus pyogenes aureus*, 4 subcutaneously, 2 intravenously, and 1 by way of the peritoneum. Two of the rabbits succumbed promptly. In the other 5 there was found in the liver, spleen, and kidneys a swelling of the arterial walls, of which the middle and external coats gave with iodine and aniline dyes the characteristic amyloid color. In the splenic pulp numerous areas were found containing dark amorphous pigment-masses at the periphery of the follicles. Here and there in the glomeruli and convoluted tubules small areas of amyloid color were observed. The organs did not present the usual macroscopic features—increased size, hardness, and glistening appearance; the splenic follicles were not affected. The degeneration occurred quite acutely in some cases, in contrast with the essentially chronic character of the process in man. As the amorphous pigment found in the spleen was hematic in origin, Petrone reasoned that the amyloid color might also be due to a deposit of blood-pigment in the tissues following the hemolysis due to the staphylococcus-infection. Sections of human lung with hemorrhagic infarct were stained in the usual manner, and the walls of certain bloodvessels, with the neighboring tissue, gave the characteristic amyloid color. Portions of spleen, liver, and kidney of a healthy rabbit were immersed for 24 hours in the blood-serum of the same animal in which hemolysis had been artificially produced. Sections showed several patches of amyloid, especially on the periphery. Sections of human organs in which hemolysis had followed hypostatic congestion gave the reaction, especially in the bloodvessel-walls and in the surrounding tissue. Portions of the heart-valves which were infiltrated with serum and blood-pigment gave similar results. The spleen, liver, and kidneys of 2 rabbits in which hemolysis had been produced by extensive burns gave the amyloid reaction. Three rabbits were inoculated with virulent cultures of *Staphylococcus aureus*; their organs also gave the amyloid reaction. Finally, portions of the spleen, liver, and kidneys of the inoculated and the burnt rabbits, a portion of the pulmonary infarct, and a portion of human liver in the early stage of amyloid degeneration were hardened in formalin and passed through alcoholic solutions and turpentine. The section of amyloid liver preserved its characteristic properties notwithstanding long immersion in these fluids; whereas all the other preparations showed much less extensive amyloid, and even its absence in some cases. It is evident that it is the blood-pigment, and not a peculiar substance derived from the amyloid material, which suffers dissolution during prolonged immersion. Since the effusion of blood-pigment into the tissues gives the latter the same staining-property as amyloid substance, it is probable that amyloid degeneration is the result of a continual and slow infiltration of hematic pigment into the tissues, such as occurs in very chronic infec-

¹ Arch. de Méd. expér., vol. x., p. 682.

tions, and of the slow transformation of the pigment in the tissues. This seems plausible in view of the fact that amyloid material develops by preference in the bloodvessel-walls and in those organs which receive the greatest quantities of the detritus following hematolysis.

TUMORS.

Parasites in Tumors.—Sawtschenko¹ believes that the peculiar formations seen in the cells of endothelioma and cancer, consisting of an outer substance containing mucin and an inner protoplasmic material with a nucleus, are **spore-bearing parasites**, resembling the malarial organism in their morphology. On one occasion he inoculated a guineapig with pus from an abscess, in the neighborhood of which yeast had been found. One month later the lymph-glands became infiltrated, and showed yeast-cells in abundance in a state of spore-formation. Fixed in Fleming's solution and stained with fuchsin, the sections showed cells containing formations very similar to the parasites of malignant tumors. These formations were found both within and without the cells, as well as in the lymph-spaces.

Squamous Carcinoma of the Gallbladder.—Nehrkorn² reports a case of squamous epithelioma of the gallbladder with metastasis. The metastatic nodules, especially in the lymph-glands, presented the typical features of squamous epithelioma, showing the epithelial pearls. Nehrkorn believes that the tumor arose by transformation of the columnar epithelium of the gallbladder, probably as the result of the action of gallstones which were present; that is, the gallstones produced metaplasia of the epithelium into an epidermal structure, and in this the carcinoma developed. [This explanation is, in a manner, satisfactory; but it must also be admitted that the tumor may have arisen from an embryonic epidermal inclusion. Tumors of this kind: namely, squamous epitheliomas arising from epithelium of a different type have been found in the bronchi and in the pancreas as well as in the gallbladder.]

Nerve-effects of Carcinoma.—Klippel³ has studied the changes in the muscles and in the nervous system in cases of carcinoma. Microscopically, 2 kinds of changes may be found in the muscles: the fibers may simply be thin and atrophic, the striation persisting; in others there is intrinsic degeneration, the protoplasm being swollen and granular, the nuclei being proliferated, while the connective tissue may be slightly increased in amount. Examination of the nerves generally reveals some degenerated fibers. In some instances the myelin-sheath is wavy and irregular; the axis-cylinder persists. In other cases it is fragmented, leaving the sheath of Schwann empty and irregular, with disappearance of the axis, thus resembling the severest forms of neuritis. The cord likewise may show very pronounced lesions; here and there degeneration of the fibers is seen, sometimes single, sometimes in groups. The anterior cornual cells, without being actually destroyed, show very much more degeneration, their prolongations being atrophied, while granules appear both in the protoplasm and in the nucleus. The cord-lesions are quite

¹ Russ. Arch. of Path., vol. v., 1898; Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 502.

² Virchow's Archiv, Band 154, Heft 3.

³ Arch. gén. de Méd., 1899; Brit. Med. Jour., Feb. 18, 1899.

irregular in distribution, there apparently being no attempt to affect any particular column. We may also note here the functional changes to which the author calls attention. He points out that tachycardia is frequent, the pulse varying from 100 to 140. Cerebral troubles consist in either a mild form of delirium, which precedes death by a few days, or in delirium with hallucinations, followed by apathy. Coma is also an occasional symptom, and presents many analogies with the diabetic form; and acetone may even be found in the urine. The author quotes Klemperer as showing that in this condition there is a diminution of albuminoids, and that probably cancerous coma is merely a manifestation of intense autointoxication.

J. V. Kelly and John H. Teacher¹ report a case of **deciduoma malignum**, and conclude that this tumor originated from the epithelium covering the chorionic villi, and that both layers of the epithelium were concerned.

Eberth and Spude² report the occurrence of **endothelioma in 3 white mice**, all descendants of the same pair, but possibly of different generations, although born in the same year. Mouse No. 1 had a tumor in the region of the neck and another in the groin, both being subcutaneous; No. 2 had 1 on the thorax and 1 in each groin; No. 3 had 1 in the neck. The tumors varied in size from that of a pea to that of a cherry. Pieces of the different tumors were transplanted subcutaneously and intraperitoneally in other white mice, but without result.

Ludvig Hektoen,³ in a case of **blastomycetic dermatitis**, found that the organisms were not so numerous in the tissues as in cases previously reported. All the mature organisms seen occurred in the miliary abscess in the epithelial proliferations, usually singly, sometimes in groups of 2 to 4, invariably situated outside the cells. Not even the giant cells in this case contained any parasites. The parasites, when not budding, are round or oval, about 10 to 12 μ in diameter; they are surrounded by a homogeneous capsule, from which the finely granular protoplasm is separated by a clear zone of varying width; in some the protoplasm contains a vacuole of varying size, which in a few instances occupies the larger part of the cell, crowding the granules closely together inside the clear zone, which becomes indistinct; in a few organisms the outer capsule contains oblong thickenings. Budding bodies in different stages are present; the granular protoplasm pushes the capsule and clear zone before it, forming an oval bud, which grows larger, and eventually separates from the mother-organism. Methylene-blue gives the best stain of the parasite, the capsule assuming a deep blue, and the protoplasm a lighter blue tint, when stained in this way. There were no red granules in the parasites, as described by Gilchrist. The morphology, cultural characteristics, and results of animal inoculation are considered. The organism here observed grew rapidly, and the formation of mycelium was not marked. Hektoen's organism was pathogenic for rabbits, guineapigs, white rats, and gray mice. It corresponded very closely to those varieties of pathogenic blastomycetes which, according to Casagrandi, produce local necrotic or suppurating foci, or permanent nodules and a fatal marasmus.

¹ Jour. Path. and Bact., vol. v., p. 370. ² Virchow's Archiv, vol. cliii., p. 60.

³ Jour. Exper. Med., vol. iv., p. 261.

Knauss¹ reports a case of **true neuroma** in a child of 8 years. The tumors—the growths were multiple—were situated under the skin of the buttocks, neck, back, thigh, chest, and abdomen. They looked like lipomas, and could be peeled out like them; but microscopically showed nerve-fibers and ganglion-cells. None of the tumors was connected by pedicle with nerves, as in the case reported by von Recklinghausen.

Durante² writes on the histologic types and on the **nature of hydatiform moles**: 1. Of all the alterations which characterize the development of the mole, the first and most constant are the budding of the syncytium and the appearance of mucus in its interior. The mucous change of the mesoderm is secondary, and the proliferation of the layer of Langhans, though customary, may not occur. The condition of the syncytium decides the ultimate fate of the tumor, and its exuberance, its penetration into the connective-tissue spaces or the maternal bloodvessels, marks the transformation from a benign tumor into an invading mole or an ectoplacental epithelioma. 2. In the hydatiform vesicle the budding syncytial covering is full of vacuoles, most of which contain mucin. Although the center of the vesicle is composed of mucous tissue, there is here neither a myxoma nor a myxomatous degeneration, but simply a mucous edema. 3. This budding of the epithelial covering, which preserves its physiologic relations to the subjacent mesoderm without altering materially the normal structure of the organ, places this tumor not among the mixed tumors nor among the epitheliomas, but in the adenomas. Resulting from a functional hyperplasia of the epithelial syncytium, the mole must be considered as a villous or syncytial adenoma. It has the benign character of the adenoma as long as it vegetates like a mole; and, like the adenomas, only becomes malignant when the epithelium begins to proliferate on its own account. 4. Like adenomas, it may undergo subsequently fatty and fibrous change; and finally the ectoplacental epithelioma, which represents the carcinoma of this adenoma, and results from the irregular proliferation of the syncytium abandoning the mesoderm and rapidly invading the maternal vessels, will rapidly cause death by metastasis.

SYPHILIS.

Flexner³ reports a case of **sypilitic ulcer of the stomach** in a man of 52 years. The ulcer had perforated. The liver contained a large tumor, formed by the confluence of several gummatous nodules. The microscopic features of the ulcer were as follows: The submucosa was principally affected, and presented infiltration with large epithelioid cells. The infiltration extended into the muscular coat, and to a less degree into the mucous layer. Foci of necrosis were found within the cellular accumulations. In these, fragmented nuclei and emigrated polymorphonuclear leukocytes were found. The bloodvessels showed a simple infiltration of the adventitia, except in the necrotic areas, where they were obliterated. More frequent than these acute phenomena were the chronic features, consisting in the presence of dense fibrous tissue with bloodvessels showing endarteritis and endophlebitis obliterans and hyaline thrombosis. Flexner believes that the ulceration was not due to the

¹ Virchow's Archiv, vol. cliii., p. 29.

² Arch. de Méd. expér., 1898.

³ Am. Jour. Med. Sci., Oct., 1898.

PLATE 5.



Gastrointestinal syphilis (Fränkel, Virchow's Archiv, Band 155).

breaking down of a gumma, but that the necrosis of the mucous membrane was indirectly brought about by the combined softening of the submucous gummatus infiltration and the obstruction and obliteration of bloodvessels in the same situation.

E. Fränkel¹ reports a case of **acquired gastrointestinal syphilis** in which the stomach (see Plate 5) presented no less than 13 separate ulcers. The specimens were obtained from a man 47 years of age. The ulcers in the stomach were for the most part on the posterior wall, and had quite a smooth base, with projecting borders. In the small intestine 31 areas of more or less deep losses of substance were found. One of the ulcers had perforated. The mesenteric and epigastric glands were scarcely swollen. The spleen contained a gumma. Histologically, it was found that the gastric and intestinal lesions were of the same nature—they represented newly formed granulation-tissue in the wall of the stomach and bowel, which tissue, at certain points, had undergone necrosis. The cells of this tissue were in nowise specific; giant cells were not present. The arteries and veins of the submucosa showed peculiar modifications, consisting in a growth, in the walls of the vessels, of a granulation-tissue similar to that found diffusely in the intestinal wall.

The Changes in the Bloodvessels in Syphilis.—The majority of writers on syphilitic disease of the bloodvessels have confined their study to the cerebral arteries, and a sentiment has gained vogue that syphilis affects only the vessels of the brain. In addition to showing that syphilis may attack the arteries of other organs, Abramow's studies² also throw light on the nature of the changes that take place in the vessels. The first case reported is that of a youth of 19 years, without a history of syphilis, who died of Bright's disease. At the autopsy the following macroscopic lesions were found: Generalized arteriosclerosis, multiple small subepicardial aneurysms, cirrhotic kidneys, the seat also of parenchymatous nephritis; acute lobar pneumonia, and edema of the brain. Microscopic examination of sections from the heart showed a high degree of thickening of the intima of the bloodvessels, the media and adventitia being for the most part normal. In the liver the vessel-walls were uniformly thickened. The renal vessels presented changes similar to those of the heart. The endothelium was entirely gone. The second case was that of a student of 25 years, who had acquired a chancre 2 years before his entrance into hospital, and who had received active antisyphilitic treatment. His symptoms were those of interstitial nephritis, with hypertrophy of the heart and arteriosclerosis. There was also a multiple neuritis. The autopsy revealed sclerosis of the coronary arteries, generalized arteriosclerosis, chronic interstitial nephritis, edema of the brain and its membranes and of the lungs; pleural adhesions on the right side. The vessels of the heart presented on microscopic examination localized intimal thickenings, with scattered involvement of the adventitia. In the coronary artery the thickened intima was on its inner side the seat of hyaline degeneration; there was also mucoid change in the new tissue of the intima. The pulmonary vessels presented nothing abnormal; nor did those of the thyroid gland. In the liver the intima of the bloodvessels was hyperplastic; this was also true of the kidney, of

¹ Virchow's Archiv, Band 155, Heft 3.

² Ziegler's Beiträge z. path. Anat. u. z. allg. Path., Band 26, Heft 2.

the stomach and intestines, and of the suprarenal glands. The vessels of the brain showed thickening of the intima, but of a trifling degree when compared with the changes in the other organs. Although in the first case there was no history of syphilis, the similarity of the vascular changes to those in Case II., with a distinct syphilitic history, lead the author to look upon these changes also as syphilitic in nature. [The history is so meager that certain other factors can scarcely be ruled out, although alcohol played apparently no part. The possibility of chronic lead-poisoning has to be considered in such cases, as well as heredity, apart from hereditary syphilis.] Careful study of the bloodvessels showed that any 1 of the 3 coats might be the seat of change—the intima presenting hyperplasia of the endothelium, the adventitia round-cell infiltration, and the media granular degeneration. When the intima and adventitia are diseased they may grow toward each other, penetrating the wall in doing so. As a rule, the intimal changes precede those of the adventitia. Staining of the elastic tissue after Weigert showed it to be for the most part normal; occasionally it was thickened. The formation of a new fenestrated membrane, as claimed by Heubner and by Wendeler, was not observed by Abramow, only a splitting of the old. In the second case the cardiac and renal vessels showed in the thickened intima mucoid, granular, and caseous areas. Caseous areas were seen in the adventitia of the peripheral arteries. This is interesting, as it was claimed by Heubner that regression-changes did not occur in syphilitic arteritis. Abramow looks upon the caseous areas of the adventitia as regenerated gummata. He takes up the question whether there is anything specific in the vascular changes in syphilis, and concludes that only a gummatous arteritis is specific. Syphilis may produce diffuse hyperplasia of the intima, but the syphilitic origin of this cannot, in the absence of gummata, be recognized by the microscope.

THE BLOOD.

J. Jolly,¹ in a paper entitled "**Researches into the Morphologic Value and Significance of the White Blood-corpuscles,**" states that in normal blood of mammals, and especially man, definite intermediary forms which would connect the mononuclear leukocyte, the polynuclear leukocyte, and the eosinophile are not found, but there are intermediary forms between most of the mononuclear types. In certain cases of leukemia all the intermediate forms between the smallest mononuclear and the polynuclear cells are found. These forms exist, but are rare in normal blood. The eosinophile cells in normal human blood have a nucleus of special character. It is usually double, sometimes triple, more rarely split up, never large and rounded, as in certain cases of leukemia. Normal human blood does not contain real intermediates between the fine granulations of the protoplasm of polynuclear leukocytes and eosinophile granulations. The eosinophile cells of normal blood, of leukemia, and of certain diseases associated with eosinophilia, possess ameboid movements. The small mononuclear leukocytes, which do not seem to possess ameboid movements in normal blood or in the blood of lymphatic leukemia, in the blood of batrachians are capable of

¹ Arch. de Méd. expér., vol. x., pp. 546, 651.

extending pseudopods. The budding clover-leaf nucleus seems to belong to the most active type of leukocyte, and seems to bear a relation to the protoplasmic activity of the cell. It is not necessarily a preliminary step to the division of the cell. Observations on the white cells of batrachian blood during their segmentation show that in a number of them one of the cellular fragments does not contain a nucleus. The death of batrachian lymphatic cells gives rise to the production of the different stages of degeneration ending in nuclear fragmentation. The presence of similar forms in inflammatory exudates suggests an analogy between these degenerated cells and certain abnormal types of polynuclear leukocytes (with multiple or divided nuclei) which are living and active. The author suggests that these types all have a strong family resemblance. To find the "missing links," it is necessary to investigate not only the blood, but also the blood-making organs.

The Presence of Sporozoa in Leukemia.—Löwit¹ claims to have discovered in the blood in leukemia a sporozoon, which he terms "*Hæmameba leukæmiæ magna*." The parasite is found in the peripheral blood in myelœmia. Multiplication occurs in the blood by sporulation. In lymphœmia the parasites are seldom found in the peripheral blood; but in the blood-carrying organs after death a hæmameba is found, which Löwit has designated as "*Amœba leukæmiæ vivax*." It occurs as an intracellular and probably also as an intranuclear body. There are forms of leukemia in which both amebas are found in the body (mixed infection). In anœmia pseudoleukæmica infantum and in the pseudoleukemia of adults a leukocytozoic ameba can be found in the blood and organs. The transmission of leukemia to susceptible animals is possible. The cultivation of the ameba has not yet succeeded.

Gwyn² reports a fifth case of **trichinosis** with increase of the eosinophile cells in the blood—17,000 leukocytes per cmm.

The Bone-marrow of Cancer-patients.—Francis Villy³ finds that there is always a double tendency **toward cellular increase and gelatinous degeneration** in the marrow of cancer-patients. This tendency is governed by the initial structure of the marrow, the rapidity of development, and the degree of the cancerous cachexia.

Contribution to the Knowledge of Malaria.—Schüffner⁴ recommends that the use of the fresh preparation in the case of malarial blood be confined to a study of the life-phases of the parasite; but that for purposes of diagnosis dry preparations be employed. He thinks that it is advantageous to dissolve out the hemoglobin before staining the corpuscles. This can only be done if the latter are fixed in special ways. Fixation is best accomplished by drying in the air. He finds that exposure to the atmosphere in a place protected from light fixes in from 6 to 30 hours. How the air acts he does not know: probably by some chemic action of its constituents. The slide (Schüffner spreads the blood on the slide), after fixation in the air, is laid film downward in a 1% formalin solution containing 5% of glycerin, and is kept there for from 5 to 10 minutes. It is then laid in a similar manner in a dish of fresh water for from $\frac{1}{4}$ to 1 minute, and then stained with hematoxylin for 1

¹ Centralbl. f. Bakt., Parasit. u. Infekt., vol. xxv., p. 273.

² Ibid., p. 746.

³ Jour. Path. and Bact., vol. v., p. 247.

⁴ Deutsch. Arch. f. klin. Med., Band 64, S. 428.

to 10 minutes, washed in water, dried, and covered with balsam. Treated in this manner, the red corpuscles are of a faint-blue color, and the parasite, even the smallest, is distinctly visible as a dark-blue, more or less pigmented disk. The author takes issue with those who speak of typhomalaria and malarial dysentery. Stationed in Sumatra, where malaria is abundant, he has seen 8 cases of typhoid fever without parasites in the blood; and 95 cases of dysentery in which the organism was either not found at all, or only occasionally as a complication. Moreover, not a single one of the 150 deaths was due to malaria. He does not deny that there can be a form of malaria with intestinal lesions, but his experience has not shown the existence of any.

The Effect of the Parasites on the Red Blood-cells.—The quartan parasite leaves the normal yellow color in that part of the red corpuscle not occupied by it, and the red cells preserve their normal size. In the case of the tertian parasite, the red corpuscle becomes pale and much enlarged, corresponding to the growth of the plasmodium. Quite different results are seen in infection through the small parasites of pernicious malaria: the red cells in this case frequently become smaller and wrinkled, the yellow color increasing in intensity. The resemblance of the yellow color to that of old brass (Messing) has led to the name of "brass bodies" (Messingkorperchen). Another feature of the red corpuscles is described by Mannaberg—viz., the presence of clefts. The author believes that the tertian and the quartan parasites are entirely distinct; and he gives the following table of differences:

	Quartan.	Tertian.
(1) Young form	Slightly motile.	Freely motile.
(2) Contour	Sharp.	Indistinct.
(3) Pigment	Coarsely granular.	Finely granular.
(4) Red blood-cells	Normal volume.	Increased volume.
(5) " " "	Normally colored.	Paler.
(6) Sporulation-form similar to	Aster.	Sunflower.
(7) Sporulation-form breaking up into	6 to 12.	15 to 20.
(8) Spores contain in fresh preparation	A brilliant nucleus.	No nucleus.

But more valuable than any of the features of this table is a peculiar staining-reaction which the author describes: The red corpuscles containing the tertian parasite present, except in their earliest youth, a very fine punctuation; while the red cells in the case of the quartan form do not.

Cleon M. Hibbard and Franklin W. White¹ find, in a study of **the leukocytosis of labor and the puerperium**, that: 1. A leukocytosis was present in over 75% of the cases in labor, being more frequent and higher in primiparas. 2. During convalescence the count falls at first rapidly, later more gradually, to normal. About the seventh day there is usually a slight rise. 3. The leukocytosis is usually higher in the younger women, regardless of the number of the pregnancy. 4. The patients farthest advanced in labor have the highest counts. 5. Breast-inflammation, even when mild, causes a prompt leukocytosis; hence the blood-count has no value in the early diagnosis of breast-abscess. 6. The leukocytosis present at the time of labor is due to an increase of the polynuclear cells.

C. A. Herter and A. J. Wakeman,² studying the **alterations in the**

¹ Jour. Exper. Med., vol. iv., p. 646.

² Ibid., p. 117.

composition of the blood resulting from experimental double nephrectomy, found that the alkalinity of the blood was distinctly increased. The increase in the percentage of urea in the blood is perhaps the most striking feature after double nephrectomy, amounting to nearly 10 times the average normal percentage. The urea is derived from the waste of proteid tissue, and perhaps partly from proteid food in the digestive tract at the time of operation. No conclusions were reached as regards uric acid. A moderate increase in the alcoholic and ethereal extractives appears constantly after nephrectomy. The percentage of increase in the ethereal extractives is greater than that of the combined alcoholic and ethereal extracts. It seems probable that the percentage of the total proteids remains unaltered, both after double nephrectomy and after double ligation of the ureters. There is an apparent constant increase in the fibrin of the blood. With regard to ash, sodium, and potassium, no positive conclusions were reached. There seemed to be a slight increase in ash and potassium content of the blood; also an increase in the salts of phosphoric acid after nephrectomy. In the case of muscle, a number of observations show that the nitrogen evolved by the action of sodium hypobromite upon the alcoholic extractives is, after nephrectomy, 4 to 5 times as great as that obtained from the alcoholic extractives of normal dog's muscle. A still greater increase is noted in the case of the liver and the brain. This increase was probably due to urea.

The Changes Occurring in the Blood of Dogs After Removing the Thyroid Gland.—A. G. Levy¹ has studied the effects of thyroidectomy in dogs on the corpuscles, hemoglobin, specific gravity, fibrin, proteids, total solids, and the ash of the blood. In the first dog he found that fresh air and good housing played as important a part as the food in preserving the animals. Munck has pointed out that milk retards the appearance of symptoms. Levy found that milk and alcohol mixed was the best restorative. Diminution of either hemoglobin or red corpuscles, or both, was often observed, but was not constant. It was never very intense. The white corpuscles were increased. This increase could not be due to suppuration in the wound. The specific gravity always diminishes after thyroidectomy. The percentage of fibrin is invariably increased. The total solids are decreased. The proteids are also decreased. The total nitrogen is also reduced. There is also a reduction in the solids of the blood-serum. The most striking point noticed in the experiment was the apparent chance-fashion in which one constituent of the blood is more specially affected now and then another. This is true of all the phenomena following thyroidectomy.

A Note on the Bacteriology of Lymphadenoma.—J. H. Abram² examined bacteriologically a case of lymphadenoma, and found a small micrococcus, hitherto not described, but which has nothing to do with the disease, because it was found only on one occasion. He always found *Staphylococcus albus*, but that was explained by the presence of an acute febrile condition.

The Action of Cobra-poison on the Blood.—J. W. W. Stevens and W. Meyers³ found that when cobra-poison was added to the blood *in vitro* 2 changes are observed, hemolysis and laking of the blood, and complete absence of clotting. They find that the hemolytic action is neu-

¹ Jour. Path. and Bact., Oct., 1898.

² Ibid.

³ Ibid.

tralized by antivenomous serum, and that the action of the latter is specific. In certain conditions the measure of this neutralization *in vitro* is a measure for the neutralization *in corpore* for guineapigs. The neutralization is chemic, not cellular nor vital. Regarding the clotting of the blood, they found also that the action of the venom was neutralized by antivenomous serum *in vitro*, and that this action was specific, and that for certain diseases the measure for the neutralization *in vitro*, using clotting as the test-reaction, was also the measure of neutralization *in corpore* for guineapigs. The neutralization of the toxin by antitoxin *in vitro* was certainly not vital or cellular, but chemic. [The author's experiment seems, then, to support Ehrlich's view, that antitoxin renders the toxin harmless by combining with it; for it is reasonable to assume that if in the test-tube the antitoxin counteracts the toxin, it is able to do the same in the body.]

THE CIRCULATORY SYSTEM.

Do the Muscle-fibers of the Heart have a Sheath?

—Glaser,¹ by staining paraffin sections with picrocarmin, was able to demonstrate a sheath or sarcolemma about the fibers of the heart-muscle. It is best demonstrated in cases of fragmentatio myocardii, and is much more delicate than the ordinary sarcolemma of muscle.

Fragmentatio Myocardii.—Despite the considerable work that has been done on the subject of fragmentation of the myocardium, the exact significance of the process is still in doubt. The earliest writers, among them Renaut, considered that the process was of antemortem origin, and played a part in the production of sudden death. Later writers, among them von Reeklinghausen and Zenker, looked upon fragmentation as an agneic phenomenon produced by the spasmodic contraction of the heart. They denied that the process was a special disease, although admitting that certain conditions predisposed to fragmentation. Israel and Estreich showed that the fragmentation occurred *through* the muscle-fiber rather than through the cement-substance between the fibers. The latter observer did not consider that fragmentation was a cause of death. Aufrecht adopted the view of Renaut. Hektoen is of the opinion that when general fragmentation is found in cases of arterial sclerosis, coronary disease, fibrous myocarditis, etc., that die suddenly, it is a satisfactory anatomic reason for the sudden fatal ending. Streckeisen² has just published a careful study of the subject, in which he deals with the frequency of fragmentation, its cause and significance. The heart, the seat of fragmentation, is soft and flaccid, and its color dirty yellowish-red; or grayish-yellow, if the patient has been ill previously; or brownish-red, grayish-brown, or grayish-red, if the death was sudden. If the fragmentation is marked, the muscle is friable and cuts like soft butter. Lighter degrees and focal fragmentation can only be determined with the microscope. Microscopically, the process is characterized by the breakage or fracture of the muscle-fibers into smaller and larger pieces. Its distribution varies, and in mild cases the foci are small and scattered. The papillary muscles are frequently affected, but their apices, where the chordæ tendineæ are attached, escape. It is worthy of note, also, that the

¹ Virchow's Archiv, Band 154, Heft 2, S. 29.

² Beiträge z. path. Anat. u. z. allg. Path., Band 26, Heft 1.

muscle-fibers in the vascular connective tissue, and in fibrous myocarditis the fibers in immediate contact with the sclerotic foci, are not affected. The fragmentation may occur in all parts of the heart, but is most frequent in the papillary muscles. The auricles in Streckeisen's cases never showed any fragmentation. As regards the place where the fragmentation occurs, whether through the cement joining the fibers or through the fibers themselves, Streckeisen has found that, as a rule, the fracture occurs *through* the fibers and not between them. In old persons, however, there may in places be a disassociation at the points of juncture of the fibers. He never found, however, any pathologic material between the broken ends; the intervals were always empty. In cases of fatty degeneration of the heart, fragmentation was very rare; it seemed that fatty degeneration to a large extent excluded fragmentation. Pigmentary atrophy, on the other hand, seemed to predispose to the process, probably because it rendered the muscle-fibers more fragile. As to the frequency of fragmentation, it was found in 85 out of 150 cases in which the heart was examined (56.6%). In 1 case it occurred under the age of 10 years (a 6-year-old child dead of traumatic tetanus). Infectious diseases and septic processes favor the occurrence of fragmentation. Regarding the causes of fragmentation, the mechanical factors possess great importance. The active contraction of the muscle-fibers is one of the chief elements in fragmentation; the latter depends upon a disproportion between the strength of contraction and the cohesive force of the muscle. Conditions which increase the one or diminish the other, or act in both directions at the same time, bring about fragmentation. In cases of sudden death from suffocation, the chief factor is the excessive muscular contraction of the heart. Passive stretching of the muscle-fiber may also play a part in the production of fragmentation. The absence of fragmentation in fatty degeneration of the heart is probably due to the fact that the degenerated fiber is not able to develop the contracting force requisite for the production of fragmentation. The active contraction of the muscle being of chief moment in production of fragmentation, it is not necessary to assume a previous injury or disease of the myocardium. Fragmentation is found in cases in which the death was so sudden that there was not time for the production of any considerable change in the heart-muscle. In all of the cases of sudden death studied by the author the actual cause of the death was suffocation, either from external mechanical causes or from internal cerebral processes; and he concludes that, in such cases at least, fragmentation is an accompaniment of asphyxia. In pure asphyxia the exciting cause of the fragmentation is probably the general convulsion and the spasm of the muscles. This is probably the cause also in death by hanging. In death from hemorrhage the conditions are somewhat different. In this there is no rise in blood-pressure. All 3 forms of death, however, have in common the lack of oxygen in the circulatory centers of the medulla. This lack of oxygen probably induces spasmodic contractions in the heart, and thus leads to fragmentation. The fragmentation occurring in the heart after previous disease, such as infectious disease, septicemia, etc., the author also attributes indirectly to a lack of oxidation. The last question dealt with is whether fragmentation can be accepted as an explanation of sudden death. Streckeisen believes that it is *not* the cause of the heart-failure, but a con-

sequence of the latter. He looks upon it as an agneic process characterizing death from asphyxiation.

In an investigation on **fragmentation, segmentation, and fibrosis of the myocardium**, John Bruce MacCallum¹ finds that there is in the heart-muscle in fibrous myocarditis a degeneration which runs a definite course. The normal muscle-cell, which is almost entirely filled with fibril-bundles, undergoes a change which begins with those most centrally placed. The process of disintegration and solution goes on from within outward until there is left only a single row of fibril-bundles at the periphery of the cell. There are often great irregularities in the disappearance of the fibril-bundles; but the general tendency is for them to disappear first in the central part of the cell. At a later stage the peripherally situated fibril-bundles become small and disappear, leaving a cell which consists only of sarcoplasmic disks, or what corresponds to the so-called undifferentiated sarcoplasm. Such a cell is usually more or less rhomboidal; but as the process goes on, it becomes distinctly spindle-shaped. The size diminishes gradually, until finally there is nothing left but the detritus and a greatly increased amount of pigment. When we study the histogenesis of these cells, we find that the process of degeneration is approximately a reversal of the developmental process. The earliest developmental stage shows a spindle-shaped cell with simple sarcoplasmic disks, while 1 of the later stages of the degeneration could be described in much the same way. The first structures to be found are the last to degenerate; and the last ones to develop are the first to disappear.

Myofibrosis Cordis.—Dehio² has examined a large number of hearts in a more careful manner than has been the custom of other observers. Sections were cut from nearly every part of the organ. In the beginning, 225 sections were made of every heart; later, from 80 to 100 were found adequately to represent the general structure. In the hearts of old persons he found the same changes that have been described by Delmange, viz., (1) hypertrophy and dilatation; (2) atheromatosis of the large coronary arteries and endoperiarteritis of the finer vessels; (3) perivascular insular or "sleeve-form" thickenings of the muscular branches, and degeneration and atrophic changes in the tributary territories; and (4) sclerotic changes in the pericardium, thickening of and atheromatous changes in the valves and endocardium. In addition, Dehio found a diffuse intramuscular fibrosis, which he designates *senile myofibrosis*. The statement that hypertrophy (and dilatation) of the heart occur in the old is interesting and contrary to the usual teaching. But as Dehio excluded all cases in which conditions that ordinarily lead to cardiac hypertrophy existed, his conclusions, conforming as they do those of Delmange, are credible. Unfortunately, no weights are given. As to the cause of senile myofibrosis, it is likely that sclerosis of the coronary arteries plays a prominent role, but overstretching of the heart-muscle is, independently of coronary sclerosis, probably capable of producing it. A study of diseased hearts has shown to the author the existence of a diffuse fibrosis in all cases of hypertrophy and dilatation. Localized fibrosis—the well-known, untranslatable *Muskel schwien* of the Germans—has long been

¹ Jour. Exper. Med., vol. iv., p. 409.

² Deutsch. Arch. f. klin. Med., Band 62, Hefte 1 u. 2.

known in these cases; but there is, in addition, a generalized process, nearly constant, to which but little attention has been paid. Microscopically, there is an increase of connective tissue, not alone between the muscle-fasciculi, but also between the individual fibrillæ. The latter are separated, and may be surrounded by small cell-infiltration. In later stages the connective tissue becomes more fibrillar. According as the connective-tissue increase is most marked between the fascicles or between the fibrillæ, the author recognizes an interfascicular and an *interstitial myofibrosis*. Vacuolar degeneration of the muscles is common. Fragmentation was frequently found, but is not considered significant. The vessels show no noteworthy changes, except in cases of senile sclerosis. The epicardium and endocardium nearly constantly present thickening and induration, which extend inward along the intermuscular septa. A study of the cases showed that pure hypertrophy was not accompanied by myofibrosis, but that in every case, no matter what the heart-lesion, in which hypertrophy was associated with dilatation, myofibrosis was present. All causes that lead to overstretching of the heart-muscle also lead to an increase in the intramuscular connective tissue. The myofibrosis is always most marked in the *auricles*. The sequence of events may be stated as follows: If the hemodynamic resistance exceeds the normal, there ensues a hypertrophy of the affected part of the heart, a hypertrophy dependent chiefly on an increase in length and thickness of the muscle-fibers. After the hypertrophy has existed for a time the connective-tissue becomes hyperplastic. With the onset of insufficiency of the muscle, retrogressive changes appear in the fibrils, and the connective-tissue hyperplasia becomes more marked. The author inclines to the view that the changes in the muscle are primary, and that the altered muscle-cells act as an irritant to the connective tissue, causing it to proliferate. Venous stasis in the heart-muscle may also be a factor in the connective-tissue hyperplasia. As to the cause of the muscle-change, Dehio believes it is connected with a deficiency of reserve force in the hypertrophied heart. Such a heart cannot respond well to increased demands, and readily enters a state of fatigue. Fatigue, if adequate recuperation does not take place, leads to atrophy and degeneration of the muscle, and thus to connective-tissue overgrowth. These muscle-changes and the fibrosis are then the anatomic substratum of fatigue and mechanical insufficiency of the heart.

Supraarterial Epicardial Fibroid Nodules.—J. H. Mason Knox, Jr.,¹ concludes: 1. Fibroid nodules seated in the epicardium directly over branches of the coronary arteries of the heart are not uncommon. They may be present in large numbers, and are found most frequently upon the surface of the ventricles; but may occur over the auricles and even on the outer surface of the ascending aorta. They are rarely observed over the coronary veins. 2. They differ in essential respects from the nodules described as “periarteritis nodosa.” They are seated outside of the adventitial coat, and lie within the epicardium. They are composed of dense, fibrous, sclerotic tissue poor in cells. In earlier stages of their formation they are richer in cells, both fibroblasts and lymphoid cells. 3. These supraarterial nodules bear no definite relation to endarteritis, although they may be associated with this condition.

¹ Jour. Exper. Med., vol. iii., p. 255.

4. Immediately beneath the nodule there were found with great regularity in the arterial wall changes which indicated weakening. In some cases the muscular coat was thinned and degenerated; but the most common and important change was reduction, and often disappearance of the elastic lamellæ and fibers, the outer elastic lamella being the one most frequently and intensely affected. These lesions were often limited to the segment of the arterial wall adjacent to the epicardium, the inner, or myocardial, segment of the same artery being free from similar alterations, or presenting them only in a slight degree. It is suggested that the absence on the outer, or epicardial, segment of the firm support afforded to the artery on the inner, or myocardial, aspect by the surrounding tissues renders the former more liable to damage to the elastic tissue, resulting from irregularities and increase of blood-pressure, associated perhaps with defects of nutrition.

5. In consequence of the weakening in the arterial wall, the artery would tend to bulge at the affected spot toward the epicardium were this tendency not restrained. The formation of the dense supraarterial nodule may then be regarded as an adaptive or compensatory change.

Concerning Primary Phlebitis Obliterans of the Main Trunk of the Hepatic Veins as a Cause of Death.—Chiari¹ calls attention to this interesting morbid condition hitherto scarcely recognized. There are only 7 cases of obliterating phlebitis of the large branches of the hepatic veins on record, and in them the disease-process was for the most part merely an extension of an inflammation from the surrounding tissues. Chiari's 3 cases, which represent a primary phlebitis of those veins, are as follows: The first patient was a woman, 23 years of age, who began to complain on Dec. 20, 1884, of intermittent pains in the hepatic and gastric regions, and loss of appetite. On Jan. 1, 1885, the pains in the region of the stomach became very severe, and vomiting set in, both symptoms continuing until her death, 14 hours later. The autopsy revealed intense pulmonary edema, ascites, enlarged spleen, and hemorrhagic erosions in the stomach and duodenum. The liver was much enlarged, its capsule tense, the surface smooth, and the substance mottled with yellow and brown. The branches of the portal vein presented nothing abnormal. The hepatic veins, on the other hand, from the point of entrance into the inferior cava up to the finest radicles in the liver itself, were distended and filled with thrombi, partly dark red and partly grayish red. The walls of the veins, at their junction with the inferior cava, were thick and fibroid, and in places the lumen was obliterated. On section the liver presented evidences of stasis-hyperemia with hemorrhages. The central veins were dilated and the walls thickened. There was no hyperplasia of the interlobular connective tissue. The walls of the large hepatic veins were thickened and had clots adherent to them. The proximal ends of the hepatic veins presented marked evidences of inflammation in the form of a proliferating endophlebitis and periphlebitis. The lumen was greatly reduced, and the additional obstruction offered by the clots produced practically a complete closure of the mouths of the hepatic veins into the vena cava. The case was evidently one of a primary chronic inflammation of the central ends of the hepatic veins. With an increase in the swelling of the intima, stasis arose in the territory of the hepatic veins, and thrombosis. The latter coincided probably with the

¹ Beiträge z. path. Anat. u. z. allg. Path., Band 26, Heft 1.

onset of the pains 12 hours before death. The phlebitis was probably of syphilitic origin. In addition to a suspicious scar on the external genitalia, the histologic structure of the hyperplasia of the intima and adventitia was suggestive of syphilis. The second case was a woman, 59 years old, who had had 6 children, 5 of whom had died in early youth. Two weeks before admission, anorexia, general weakness, and swelling of the abdomen set in, and 5 days later edema of the left leg. Upon admission, the left femoral vein was found converted into a hard cord. The uvula and half-arches were reddened and covered with a whitish deposit. The thyroid gland was slightly enlarged. The cervical veins were dilated, as were also some of the veins of the thorax. The pulse was intermittent and dicrotic. The liver was enlarged, irregular on the surface, and its edge firm. There was ascites. The patient died suddenly from collapse. At the autopsy 3½ liters of bloody serum were found in the abdominal cavity. The left femoral vein, left external iliac, and left common iliac were thrombosed. The lungs were partially adherent, congested, and very edematous. The left pulmonary artery contained numerous emboli. Projecting from the posterior wall of the left ventricle was a sacular aneurysm the size of a hen's egg. The horizontal branch of the left coronary artery was obliterated. The obliteration extended up to the margin of the aneurysmal sac. The liver was enlarged and firm, and had a tight-lace furrow; the capsule was not thickened; the parenchyma was congested in places and reddish-black. The portal vein and nearly all of its branches were filled with recent clots. Similar clots were found in the hepatic veins. The openings of the main branches of the latter into the inferior vena cava were completely occluded by scar-tissue. The spleen was twice the normal size, firm, and full of blood. The kidneys were slightly reduced in size, firm, and marked by scars on the surface. The mucous membrane of the stomach and small intestine was congested; and that of the large bowel, with the exception of the rectum, was the seat of hemorrhagic infiltration. Careful microscopic examination was made, but we cite only the features of special interest. The liver was the seat of marked atrophy from passive congestion. The central veins were thickened and dilated. Clots were found in the hepatic veins and in many of the branches of the portal veins. The interlobular connective tissue was a little increased. The mouths of the hepatic veins were completely obliterated through hyperplasia of the intima. The adventitia was not altered. Toward the periphery the phlebitis disappeared rapidly. In this case the phlebitis obliterations appeared to have been a primary disease; it had not developed as an extension from the surrounding tissues. Although a history of syphilis was not obtained, the obliteration of the coronary artery and the endophlebitis were suggestive of a syphilitic origin. The third case was that of a woman, of 29 years who in Nov., 1894, began to have pain and a feeling of tension in the hepatic region, followed by a swelling of the abdomen, belching, vomiting, and insomnia. The liver and spleen were enlarged, there was marked ascites, and the diaphragm was pushed up. The patient was tapped twice. On December 31 coma set in, and death occurred on Jan. 3, 1895. There was a history of gonorrhea, but not of syphilis. At the autopsy the liver was slightly enlarged, but flabby. The main branches of the hepatic veins were markedly thickened, and at their entrance into the inferior cava

were so contracted that only a probe could be inserted. In addition to this, the lumen was still more encroached upon by recent thrombi. The lungs were edematous, and the left lung contained several hemorrhagic infarcts. Microscopic examination showed that the ends of the hepatic veins were the seat of an irregular thickening of the intima, which extended peripherally for some distance, and in places, also, had caused complete obliteration even in the smaller branches. In this case, also, the obliterating phlebitis had caused the death of the patient. Although there was nothing in the history nor in the anatomic findings suggestive of syphilis, the author suspects that this case was also due to luetic infection. The 3 cases have a good deal in common. There was in all the cases a productive inflammation of the wall of the veins, an endophlebitis which in the first case was associated with a periphlebitis. The inflammation tended to obliteration, and was in all of the cases an independent process. Its consequences were the same—namely, passive hyperemia, atrophy, and induration; and, secondly, stasis in the territory of the portal circulation, with abdominal dropsy. The last, the ascites, was the cause of death in all 3 cases, inasmuch as by pressing up the diaphragm it led to pulmonary edema. A secondary consequence of the endophlebitis was thrombosis, and this played a most important part in that it caused such a marked disturbance of the circulation that the collateral circulation could no longer overcome it. Pronounced ascites was the result, and led to death. Chiari considers the phlebitis obliterans of the main trunks of the hepatic veins a disease *sui generis*, and believes that it depends upon syphilis.

MISCELLANEOUS.

The Uric-acid Infarct of the Newborn.—H. Spiegelberg¹ has endeavored to ascertain the causes of the formation of uric-acid infarcts in the kidneys of the newborn. No satisfactory theory exists. Virehow maintained that it was due to the profound change in the metabolism following birth and leading to an increased formation of uric acid. But the infarct is found only in about one-half the number of infants examined, and is not met with in many animals in which birth is attended by the same modifications of the conditions of life as in the human infant. Vierrordt attributed the formation to the feebleness of the oxidation-processes in the infant. The author was able, by injecting urates subcutaneously into puppies, to produce typical uric-acid infarcts in the kidney. The necessary dose was 0.25 gm. of uric acid per kg. of body-weight. In adult dogs the same relative quantity never produced infarcts. Evidently the uric acid is decomposed to a less extent in the infant's organism; but the cause of this is not a lessened oxidation-process, for the author was able to demonstrate that the puppy oxidized sodium formate and thiosulphate more readily than the adult dog. Physical causes also play no part. The urine of newborn infants, despite its content of uric acid, still possesses a greater power of dissolving uric acid than the urine of adults. The causes of the formation of the infarct are then still unknown; all that can be said is that uric acid is less readily decomposed in the infant's body.

¹ Arch. f. exper. Path. u. Pharmacol. Band 41, Heft 6.

Balantidium Coli.—Dehio¹ reports a fatal case of chronic intestinal disease apparently due to the *Balantidium coli*. The disease had lasted 1½ months. It began with vomiting, loss of appetite, watery diarrhea, loss of strength, etc. The autopsy showed diphtheritic ulceration of the large intestine. The mucous membrane contained large numbers of the *Balantidium coli*, which had also been found in the stools. In 1896, Gourwitsch, an assistant of Dehio, described 7 cases of *Balantidium coli* in the human intestine, which clinically had presented signs of chronic intestinal catarrh with diarrhea, and, postmortem, showed widespread ulceration of the large intestine. Another pupil of the author, Voit, has described 3 cases, 2 of them fatal, in which ulceration was not present. Up to this time, 61 cases of the disease have been reported.

Chlorid-metabolism in Pneumonia.—Robert Hutchinson² says that the absorption of chlorids from the alimentary tract goes on normally in acute fevers, and no vicarious excretion occurs by the skin, bowel, sputum, or other channel. The sputum in pneumonia is very rich in NaCl up to 19%; yet the total amount excreted in the sputa is small. The inflammatory exudate contains from 2% to 4% of sodium chlorid in its solid matter, not more than 3 times the amount in healthy lung-tissue. Thus, the total amount of sodium chlorid in the exudate will not account for more than one-third to one-half of that retained within the body. Failure of the kidneys to excrete the chlorids is a theory disproved by experiment and by comparison with the conditions in acute nephritis. All the organs and the fixed tissues are somewhat richer in chlorids than normally; in the blood the chlorids are diminished. The increased excretion of chlorids in malaria is probably to be ascribed to increased arterial pressure in the kidney during pyrexia.

Parathyroid Glands of the Cat.—D. A. Welsh³ concludes: 1. Removal of all the 4 parathyroids in the cat leads to acute and severe symptoms, with a rapidly fatal issue, even though the thyroid be retained practically uninjured. 2. Removal of 3 parathyroids does not lead to death, but may cause transient symptoms similar to those which result from the removal of all the glandules; loss of 2 parathyroids does not produce any appreciable change. 3. Removal of the thyroid and some of the parathyroids may lead to death, with acute symptoms, if only one parathyroid is left; but may not induce any obvious derangement if 2 parathyroids are retained, at least for several months. 4. Mouth-administration of the fresh parathyroid of the ox has no effect either in mitigating the symptoms or in preventing death after removal of the thyroid and the parathyroids in the cat, even though enormous doses are given.

Hepatic Cirrhosis in a Guineapig, Produced by Inoculation with a Bacillus.—Weaver⁴ obtained from a guineapig that died spontaneously a bacillus about the size of a typhoid bacillus, not stained by Gram's method, with which he was able to produce interesting lesions in guineapigs. Animals inoculated with small doses of 24 hours' bouillon-culture lost weight and died after 8 or 9 days. Under such conditions the liver presented changes characteristic of cirrhosis, marked proliferation of the

¹ Russian Arch. of Pathol., vol. vi.; Centralbl. f. Bakt., Parasit. u. Infekt., Band 25, S. 234.

² Jour. Path. and Bact., vol. v., p. 415.

³ Ibid., p. 217.

⁴ Phila. Med. Jour., Feb. 4, 1899.

bile-ducts, accumulation of connective tissue between the lobules and within them, and necrosis of the liver-cells. If death is acute, the principal change in the liver is necrosis of the cells. The dead bacilli in cultures devitalized by heat produce the same effect.

W. T. Councilman¹ states that **acute interstitial nephritis** is found in the infectious diseases of children, particularly in diphtheria and scarlet fever, but may be met with in other contagious diseases. The disease is characterized by general and focal infiltration of the interstitial tissue of the kidney with cells which correspond to Unna's plasma-cells. The focal character of the infiltration is marked; even in the cases in which all parts of the kidney show some interstitial cellular infiltration the cells are most abundant in certain foci; namely, in the boundary-zone of the pyramids, in the subcapsular region of the cortex, and around the glomeruli. A considerable number of cases is found in which the bloodvessels of the boundary-zone of the pyramids contain numbers of lymphoid and plasma-cells without any infiltration of the interstitial tissue. The new cells in the interstitial tissue are due to emigration from the bloodvessels and multiplication by mitotic division. The cells may emigrate as plasma-cells or as lymphoid cells; and the latter may change into plasma-cells in the tissues. In the normal individual plasma-cells may be formed in the mucous membrane of the intestine, where they practically constitute the entire tissue between the epithelium and the muscularis mucosa, and to a limited extent in the spleen. In diphtheria, scarlet fever, and probably in a number of infectious diseases, plasma-cells are formed in great number in the spleen and bone-marrow, and to some extent in the lymphatic glands. In the spleen they are formed from the cells of the Malpighian bodies, which are often principally composed of them; and to some extent from the cells in the pulp. They are formed from the lymphoid cells. No adequate explanation is found for the focal character of the lesions in the kidneys. There is some ground for believing that the physical conditions of the circulation may have something to do with the accumulation of plasma-cells in the vessels in certain places. The explanation of the foci cannot be found in primary focal degeneration of the epithelium. Epithelial degeneration is always present in these cases; but it is diffuse. In foci where it is most intense and due to the interstitial changes, polynuclear leukocytes are found in the tissue, in the degenerated epithelium, and in the tubules. Polynuclear leukocytes, and not plasma-cells, are attracted by degenerated tissue. The foci in these cases are not due to the local action of bacteria.

¹ Jour. Exper. Med., vol. iii., p. 395.

NERVOUS AND MENTAL DISEASES.

By ARCHIBALD CHURCH, M. D.,
OF CHICAGO.

The Year's Work.—The year has been a very productive one in the matter of literature, and some novel observations, as well as practical deductions, have appeared. Westphal has revived attention in a pupillary phenomenon for some time overlooked; namely, the dilation of the pupil after the eyelids have been rigorously closed for a few moments a condition that is likely to mislead investigators of the pupillary reflex unless understood. The toe-sign described by Babinski has been found to be of considerable significance as an index of disturbance in the upper motor neuron; and is usually associated with organic changes in the lateral tracts of the cord. He has also found it present in true epilepsy immediately after the attacks, furnishing a valuable index of their recent occurrence.

In the field of multiple neuritis there are additional contributions to the changes of the nuclear cells in the cord and brain; and erythromelalgia is apparently in transition from the category of peripheral disorders into those associated with spinal changes. It has been found that the lower portion of the spinal cord may be rendered entirely anesthetic for the transmission of painful sensations by the injection of a small amount of cocaine within the dural sheath by lumbar puncture, rendering operations upon the lower extremities painless without the production of ordinary surgical anesthesia. A large number of articles on tumors of the spinal cord have appeared; and one by Putnam and Warren gives the best tabulation of operated cases now available. Surgical intervention receives distinct support. The changes in the spinal cord associated with profound anemias have been very widely discussed. There is a growing opinion that the changes in the cord are similar to those described by Gowers under the title of ataxic paraplegia, perhaps more commonly known as combined sclerosis of the cord. On the subject of tabes a large number of contributions have been made. An article of distinct value is one by Bonnier, who discusses the labyrinthine disturbance very commonly present, and usually overlooked; also, the subject of paralysis and muscular atrophy in tabes, and that of lack of muscular tone have been prominently brought forward. The exercise-treatment is worthy of the favorable opinion expressed of it in previous issues of the YEAR-BOOK. The neurotic type, or leg-type, of progressive muscular atrophy has now distinctly entered the category of spinal muscular atrophies, where very probably all the other progressive muscular atrophies will eventually be found.

The entire subject of spinal meningitis, in view of the work done in

this field during the past year, requires revision ; and to this end the masterly articles by Osler, published in the *Philadelphia Medical Journal*, the *West London Medical Journal*, and the *British Medical Journal*, constituting the Cavendish Lectures of 1899, occupy the first place. Kernig's sign has proved a very uniform indication of early muscular rigidity. The sporadic and epidemic varieties of meningitis have been almost conclusively proved to be solely dependent upon the action of the meningococcus.

There is rapidly growing material on the subject of acute nonsuppurative encephalitis. Some noteworthy articles on the subject of brain-tumor have appeared ; and the detectability of highly vascular and hemorrhagic growths by the x-ray has been demonstrated. Two important cases of aphasia in right-handed individuals, associated with right-sided brain-lesions, have appeared ; and a case of absolute motor agraphia, due to a perfectly circumscribed lesion in the left hemisphere, in the region of the motor area that had been theoretically considered associated with the motor memories of written language, has now made the theory good. The symptomatology of cerebellar disease is becoming very thoroughly sifted, and the apparently paradoxical statements of most writers may soon be harmonized. Cases of disease of the brain due to the action of gas-forming microbes have been reported in this country.

A very interesting study of handwriting in chorea has appeared, one variety of which is practically a cortical symptom, showing itself as agraphia, again emphasizing the cortical localization of the disease-process in this infection-neurosis. In regard to tetanus, numerous cases of its treatment by intracerebral injection are reported, with varying results. Apparently, recoveries are in direct proportion to the tardiness of the appearance of the tetanus after the infection-wound is received, and correspond to the ordinary rule, that cases appearing within a very few days are usually fatal, while those appearing after the lapse of 10 or 12 days commonly recover, with or without treatment of any kind. If the reported discovery of the bacillus of hydrophobia by Spinelli and Rivolt is confirmed, certain knowledge will be had of the microbic character of this disorder.

Several important studies of paralysis agitans have appeared, and several new symptoms in this disease have been noted. Fränkel calls attention to the boggy skin, a sort of hidebound condition, which he thinks may be suggestive of some glandular disease, perhaps similar to that found in myxedema. Investigations of the thyroid gland and its constituents have advanced, and results of a valuable sort are noted.

Several important contributions have been made to the subject of changes in the nerve-cells due to fatigue, largely confirming those of Hodge, generally known in this country, and serving to give us the best understanding of the conditions in neurasthenia and other fatigue-neuroses. The subject of hysteria has received notable contributions, especially in the domain of symptomatology. Epilepsy and its treatment receive the usual attention. Ohlmacher reports additional cases to sustain his idea of the lymphatic constitution in this disorder. The effect of bromid upon the brain-cells has been carefully studied, and the value of various remedies investigated, by the direct examination of the cortex after their

administration, proving that bromid is the greatest cortical inhibitor and the active agent in its various combinations. The treatment of epilepsy by removal of the sympathetic ganglia in the neck has been vigorously pursued by Jonnesco; but in the hands of independent observers it has been found practically valueless. For the treatment of glaucoma and exophthalmos its advantages are more in evidence. The subject of night-terrors has received considerable attention, and there is a growing belief that those things which interfere with respiration during sleep, such as adenoids, weak heart, etc., producing a prolonged state of moderate asphyxiation, are the most important elements in its development.

In mental medicine active investigation has been made on the subject of autointoxication and other intoxicants in the production of mental disorders. The subject of syphilis in relation to general paresis continues a bone of bitter contention, and the end is not yet.

SYMPTOMATOLOGY AND SYMPTOMATIC DISORDERS.

A New Pupillary Phenomenon.—A. Westphal¹ calls attention to the fact that when the orbicularis oculi is energetically brought into action and the eye is closed with vigor, there is a narrowing of the pupil, which dilates as soon as the eye is opened. G. Mingazzini² points out that this phenomenon was described by Galassi in 1887.

Biernacki's Symptom.—Kerval and Laurent³ made a study of this symptom on 125 paralytics and on 300 nonparalytic insane, and conclude that the symptom is so uncertain that it can have no real value of any sort in a differential diagnosis. But they willingly admit with Cramer that, joined with other symptoms of general paralysis, the symptom of Biernacki may constitute an additional element of value in favor of the diagnosis. [The symptom in question is insensitiveness of the ulnar nerve at the elbow, and is sought by exercising forcible pressure over the nerve at this point. It is also found that tabetics very commonly present this insensitiveness, sometimes even in the preataxic stage.]

The Toe-sign.—M. Cohn⁴ makes a study of Babinski's toe-sign in a number of cases, and refers to the statistics of others in the study of this sign. In adults with no lesion of the nervous system, upon instituting the test, he found flexion of the toes in 60%, extension in 20%, absence of movement in 10%, and uncertain movements in 10%. In the 20% showing the extension-phenomenon it was not confined to the great toe, but generally affected 2 or more of the toes. In 2 cases of amyotrophic lateral sclerosis he found the sign well marked. In 2 cases of spastic spinal paralysis it was also present. In 2 cases of apoplexy he found the sign within a few days of the onset. In 2 cases of brain-tumor he found the sign on the side opposite the location of the tumor. In 1 case of hysteria, with paralysis of the lower extremity, he found the sign; while upon the opposite side the test gave rise to flexion of the toes. He concludes that, as yet, it is not pathognomonic for organic diseases of the lateral tracts. J. Babinski⁵ makes another contribution to the subject of the toe-sign, as formulated by himself. He found that in **Jacksonian**

¹ Neurol. Centralbl., Feb., 1899.

² Ibid., June 1, 1899.

³ Arch. de Neurol., Feb., 1899.

⁴ Neurol. Centralbl., July, 1899.

⁵ Soc. de Neurol. de Paris, July 6, 1899.

epilepsy the phenomenon could be evoked immediately after the attack on the convulsed side, while in the intervals the plantar reflex was normal. In a patient suffering from brain-tumor, and subject to general convulsions, with loss of consciousness, and incontinence of urine and feces, the toe-sign was observed on both sides, while the tendon-reflexes remained unaltered. A quarter of an hour later, the patient having regained consciousness, the plantar reflex was again normal. He has also observed the occurrence of the toe-sign in idiopathic epilepsy during and for a short time after the attack. It is sometimes attended by exaggeration of the tendon-reflexes. In hysteria, during the attacks as well as in intervals between the attacks, the toe-sign is constantly absent; it therefore seems to have a differential diagnostic value in these 2 neuroses.

James Collier¹ also reports an investigation of **Babinski's sign**. He investigated 500 cases, and is able to confirm the conclusions of Babinski, Brissaud, and Van Gehuehten. His conclusions are: 1. The plantar reflex of healthy subjects, with the exception of infants, consists of a regular succession of contractions in certain muscles to increasing stimuli. The response may be confined to certain muscles of the hip. It is doubtful whether the plantar reflex is ever constantly and completely absent in healthy subjects. The term "flexor response" is proposed for this form of plantar reflex. 2. In infants, up to the age of learning to walk, the succession of contraction of the muscles in the plantar reflex is entirely different from that seen in the adult; the change from the one form of the plantar reflex to the other occurring gradually with the establishment of complete volitional control over the legs, usually between the second and the third year of life. The term "infantile response" is proposed for this form of plantar reflex. 3. During sleep the plantar reflexes are diminished, and the infantile and adult forms preserved, except in some children up to the age of 12 years, in whom in deep sleep the infantile form of reflex returns. 4. In almost all cases of lesions of the pyramidal systems the form of plantar reflex is changed, a plantar reflex resembling closely that found in infants appearing. This change in the form of the reflex is one of the first signs of such lesions to appear, and is the last to disappear when the lesion is temporary. It may be the only unequivocal objective sign of a lesion of the pyramidal system. This form of reflex is never found under other conditions, and is a sign of great clinical value. The term "extensor response" is proposed for this form of the plantar reflex. 5. In cases of total transverse lesion of the cord, the extensor response is the only reflex phenomenon present in the lower limbs. 6. In functional cases the plantar reflex is often difficult to elicit, and there is frequently no response in the foot; but in such cases a response may usually be observed in the hip-muscles. The form of reflex is the flexor response. 7. In tabes dorsalis the plantar reflex was entirely absent in 20% of the cases. The response is often confined to the hip-muscles. The attempt to obtain the reflex frequently may set up irregular movements of the foot, lasting some time. The reflex, when present, is the flexor response. 8. In peripheral neuritis the reflex, when present, is the flexor response. The hip-muscles respond alone in some cases. 9. In cerebral and cerebellar tumors the flexor response occurs if there is no involvement of

¹ Brain, 1899.

the pyramidal system. 10. In neurasthenia, chorea, paralysis agitans, poliomyelitis, myopathy, and sciatica the flexor response is found. 11. In lesions of the pyramidal system a degree of pes cavus is frequently found. It is intimately associated with the extensor response in the plantar reflex, and is produced by a state of reflex hypertonicity preponderating in those muscles which respond most vigorously in the plantar reflex. In all such cases of pes cavus evidence of increased tone in certain muscles can be demonstrated. 12. The theory that the pes cavus of spastic conditions is due to weakness of the interossei is not justified.

Acute Cerebral Ataxia.—M. Dinkler¹ reports *in extenso* a case under the above title. He points out that in the literature during the last 3 decades only a small number of similar observations have been reported. Leyden, in 1868, described 1 case; followed by Westphal with 5 cases, and later by Ebstein with 1 case, and another by Lenhartz. In 1891 Leyden reported an additional case. The patient in question, a man of 33, had always been well up to his twenty-eighth year, when, after exposure to cold, he had fever, became unconscious, and was very delirious for 2 days. Upon the third day he recovered consciousness, but could only remember a pain in his left shoulder, which seemed as it were being cut off. He then presented the most profound ataxia of all the muscles of the body and extremities; and his speech was also affected. Sensation was everywhere normal, as were also the reflexes. During the next 5 years the ataxia improved slightly, so that the patient was again able to sit, to talk, to stand, and to walk, having learned to do so with effort. Dinkler would locate the lesion somewhere in the medulla, affecting the centripetal and centrifugal motor tracts; and presumes that it is due to some infectious process, as indicated by the clinical features of the onset. Westphal's cases also had infections, such as smallpox and typhoid. The only case that has been anatomically investigated is one by Ebstein, which does not seem to belong strictly to the category, but should rather be classed as one of multiple insular sclerosis.

Leukocytosis in Convulsions.—F. G. Burrows² makes a study of leukocytosis associated with convulsions. The studies were carried out on 7 patients during and after one or more convulsions. These patients presented 5 different diseases, and the findings were checked by investigations on a normal individual during periods of rest and after violent muscular exertion. Senile dementia, senile confusion with arterial sclerosis, terminal dementia and general paralysis of the insane, katatonia, and puerperal eclampsia were the diseased conditions in question. The author believes that he has been able to show that the muscular work of the convulsion does not alone explain the leukocytosis which was invariably found after the attack, and thinks that he has demonstrated that such a leukocytosis is made up of 2 parts: a physiologic, due to muscular work; and a pathologic element, in which the polymorphonuclear elements are increased out of proportion to the other forms. The leukocytosis further bears a relation to the severity of the disease.

Head-nodding and Head-rotation, Usually Associated with Nystagmus, in Young Children.—Charles J. Eldredge³ gives a report of 2 cases of this rare form of muscular defect occurring in chil-

¹ Neurol. Centralbl., June 15, 1898.

² Am. Jour. Med. Sci., May, 1899.

³ Ibid., Feb., 1899.

dren, with full reference to the literature of the subject. He finds that the majority of cases occur between the ages of 6 and 12 months, with a preponderance of females. The movements are gyral, usually, although a combination of nodding with lateral movements may be encountered. They are smooth, rhythmical, regular, and free from spasmodic jerking; and cease during sleep, when the patient is in the recumbent posture and when the eyes are covered. The nystagmus may be binocular or monocular, vertical, rotary, or mixed and alternating, and different in the 2 eyes. If the head is held while the patient is awake and erect, the nystagmus, if latent, is developed, and conjugate deviation usually accentuates it. There seems to be an intimate relation with epilepsy, which frequently occurs in the patients or in near blood-relatives. The tendency to recovery is pronounced, and, as a matter of fact, all reported cases have recovered. As to the exciting causes, teething, rickets, gastrointestinal irritation, traumatism, and other factors have been mentioned. The author looks upon the condition as due to unstable nervous supply correlative with the developmental period of infancy. The treatment that has seemed to give the best results is the use of the bromids and general measures to increase growth and strength.

Paralysis after Whooping-Cough.—Leroux¹ reports 38 cases. Such instances naturally usually occur in children, and generally appear at the convulsive stage of the disease or in its decline. The disease commonly presents violent paroxysms with other infections, such as bronchopneumonia or influenza, scarlatina, tuberculosis, etc. Four symptomatic groups of cases are recognized: 1. Cerebral paralysis. 2. Spinal paralysis marked by paraplegia. 3. Peripheral paralysis, usually a multiple neuritis. 4. Cerebrospinal paralysis and cases of disseminated sclerosis.

Sleep.—J. B. Bradbury,² in the Croonian Lectures for 1899, on the subject of sleeplessness and hypnotics, concludes that the condition during sleep is rather one of blood-stasis than of simple anemia. In either case a small amount of blood passes through the cerebral vessels in a given time, and this is in reality an essential factor. Although he cannot regard a fall in blood-pressure as the cause of sleep, yet the diminished supply of nutriment thus afforded must exert a depressing influence on the metabolism of the cerebral cells, and aid in sustaining, if not inducing, sleep. That the fall of arterial pressure is not necessary is shown by many hypnotics that exert no influence in this direction; but he adds that it may also be said that, their influence being fairly equal, those hypnotics that depress blood-pressure are more certain sleep-producers than those that do not. Chloral, for example, is more certain than any of its derivatives.

Sleeping-sickness.—Patrick Manson³ furnishes a clinical lecture on this African disease, 2 subjects of which had been forwarded to London for treatment and study. In both instances he found the *Filaria perstans* in the blood. The intestinal canal was filled with various parasites, which, however, were easily dislodged, and apparently had no relation to the disease. He concludes, after a careful investigation of this particular filaria and of the geographical distribution of the sickness, that the germ of sleeping-sickness operates primarily on the encephalon; that

¹ Jour. de Clin. et de Thér. Infant., No. 13, 1898.

² Brit. Med. Jour., June 24, 1899.

³ Ibid., Dec. 3, 1898.

this germ is possibly *Filaria perstans*; that the parasite in its wanderings, either by entering the brain or by interfering more or less directly with its nutrition, may gradually bring about a cessation of its function, ultimately leading to secondary neuromuscular malnutrition and symptoms of sleeping-sickness. [If it can be shown that *Filaria perstans* is the cause of sleeping-sickness, the next step will be to ascertain the life-history of this parasite outside the human body; this once known, it will become easy to indicate an efficient prophylaxis.]

The Blood in Syphilis.—Kuperwasser¹ has made a study of the condition of the blood in syphilis to determine the changes resulting from the disease and the changes produced by mercurial treatment. He classifies the white corpuscles as young, mature, and old; and shows (1) that in the blood of healthy people mercury modifies the proportion of leukocytes, so that the young variety is considerably increased and the old considerably diminished. (2) That in syphilitics the blood reacts to mercury by a considerable diminution in the proportion of the young, and a corresponding increase in the old, leukocytes. This is independent of the stage of the disease and of the manifestation or absence of syphilis, and is also independent of previous specific treatment. Those who have undergone treatment by mercury within 4 months form an exception to the rule, and then the reaction is that of healthy blood. Kuperwasser, basing his conclusions on 48 cases, hopes that the method will prove of value in the diagnosis of syphilis, and that it may also show the relation of syphilis to the parasymphilitic diseases outlined by Fournier.

Nervous Symptoms of Secondary Syphilis.—Fournier² calls attention to the nervous manifestations most frequently found in women in the secondary period of syphilitic disease. The first is **headache**, which Fournier divides into 3 degrees. In the first degree it is troublesome, but does not interfere with the ordinary avocations. In the second it simulates migraine almost absolutely. In the third the pain is so severe as to prevent exertion almost completely, and is accompanied by vertigo, ringing in the ears, and in many cases by melancholia. This pain may be constant or intermittent. In the first period it is more severe toward evening; in the second it comes on between 5 and 7 P. M. This form of headache may vary, lasting from several days to several months; but all forms yield promptly to mercury. **Insomnia** also occurs in this stage of syphilis, and particularly in women. In some instances it is due to the headache, but in other cases there may be no concomitant nervous disturbance. The patient may pass several nights without sleep. **Neurasthenia** or **asthenia**, like the other 2 symptoms, is almost confined to women. It may cause total inability to follow ordinary pursuits, and in extreme cases may give rise to utter prostration. The heart-beats may be extremely feeble, pulse almost imperceptible, digestion torpid, perception dulled, and trophic functions greatly retarded. Fournier says that this symptom is more common than the other 2, and more frequently misunderstood, being often mistaken for tubercle, pernicious anemia, etc. Like the other disorders, it promptly yields to mercurial treatment.

¹ Arch. des Sci. Biol. de l'Inst. impér. de Méd. expér., a St. Petersburg, tome vi., No. 4, 1898.

² Jour. de Méd., Apr. 10, 1899.

Uremic Palsies.—Baillet¹ records a very interesting and valuable study of the various palsies associated with uremic conditions. The **prodromes** are those of nephritis, and consist of vertigo, headache, localized or generalized edema, polyuria, dyspnea on effort, and dyspnea of a toxic nocturnal variety, vomiting, neuralgia, etc. In conjunction, on examination, one usually finds ventricular hypertrophy; marked galloping bruit; small quantity, or slight density, or decoloration of the urine; the presence of albumin; more rarely, pulmonary edema and pleural effusion. These symptoms may be noted; but in general, in most cases of interstitial nephritis of the aged, the clinical manifestations of uremia previous to the appearance of paralytic accidents are slight and frequently unnoticed. At most, fulness in the head, vertigo, and dyspnea are complained of. On the contrary, in nephritis of more rapid progress, the patients are youths or adults; and numerous prodromes, such as lumbar pains, vomiting, headache, edema, anasarca, and repeated convulsions, are observed. In two-thirds of the cases the onset of paralysis is by convulsions or coma. The **convulsions** frequently observed, especially in the course of subacute nephritis, present in some cases as prodromic phenomena. More often they immediately precede the motor disorders of paralysis. Their resemblance to the convulsions of epilepsy is perfect; that is to say, they may be manifest in various forms: Loss of consciousness, absences, forgetfulness of the attack, succession of tonic or clonic phases, generalized convulsions of all the members and the face, etc. In no case has he noted the initial cry or biting of the tongue, or the flexing of the thumb into the palm of the hand. Finally, the tonic phase sometimes is lacking. The convulsions may be limited to one side of the body, to a limb, or to the face, and then present the characteristics of Jacksonian epilepsy. Their duration varies from minutes to hours, often to several days, and the epileptic status may be presented. **Coma**, as frequently as the convulsions, introduces the paralytic disorder. Suddenly the patient becomes unconscious, with full muscular relaxation and insensibility to exterior excitation. The coma may present all degrees of intensity, but generally is stuporous. Consciousness is not completely extinguished, so that upon vigorous arousing a word of reply may be obtained from the patient. There is frequently conjugate deviation of the head and eyes. The coma may be transitory and repeated. Regarding the **clinical forms** of uremic palsies, the author states that in 63% the form of right or left hemiplegia is present. Sometimes the face may escape, and sometimes the type is one of brachial monoplegia. This, in from 15% to 20%, affected the right side, and was accompanied by aphasia. Facial paralysis is, however, rare. The beginning and evolution of the uremic palsy vary according to the nature and progress of the nephritis that produces it. Clinically, he would distinguish **2 varieties**, according as the renal lesion occurs in the aged or in infancy and young adults, and as to whether it is a chronic nephritis or a subacute parenchymatous variety. In the chronic form the prodromes, as already indicated, are slight, and may escape attention altogether. The attack is ordinarily sudden, and frequently imitates a condition secondary to cerebral hemorrhage, so that only a postmortem in some cases may determine the nature of the cerebral accident. In the palsies associated with

¹ *Gaz. hebdom. de Méd. et de Chir.*, July, 1898.

subacute nephritis in younger individuals, the hemiplegic form is usually the one of preference, and is usually preceded by abundant warnings, though the age of the subject should indicate the necessary investigation. A history of scarlatina or pregnancy is, of course, of the first importance. Uremic **palsies** are, as a rule, incomplete, so that paresis is more often noted than complete paralysis. The paralysis, too, is of the limp variety; very rarely are the paralyzed or paralytic members the seat of tonic contraction. While uremic palsy also may persist, with modifications, to a fatal termination, more commonly it presents a variability. It may decrease little by little, disappear almost suddenly, and again reappear; or the paralysis affecting one side may disappear, to reappear upon the other side of the body. Disorders of **sensibility** are commonly noted, and are relative to the disorders of motility. The **reflexes** are generally abolished or diminished on the paralyzed side; but they may be normal or even exaggerated. The **pupils** are almost invariably dilated, and conjugate deviations in hemiplegia have already been mentioned. Ordinarily there is no modification of the **temperature-curve** until toward the fatal termination. All varieties of **aphasia** may be presented, but ordinarily the motor variety is displayed, or several varieties may succeed each other, or a limited variety may become a generalized aphasia. Like the motor paralysis, it is characterized by variability as to duration and form. The **prognosis** is uniformly grave; three-fifths of the cases die within a few days; and palsies associated with chronic nephritis appear to furnish the greatest mortality, while those dependent upon scarlatina are of decidedly better outlook. Of 13 cases in which conjugate deviation of face and eyes was noted, 11 were fatal; therefore it appears to be an ominous symptom. The restitution of motor power is not always rapid, and a slight weakness may remain almost indefinitely in the affected members. As to the mechanism of the paralysis, Baillet believes it is entirely explained by local **edema** of the cortex; and the **treatment**, of course, is primarily that of the kidney-lesion.

Laughter as a Symptom in Disease.—J. M. Raubin¹ makes an interesting study of the peculiarities of laughter occurring in various diseases, particularly those of nervous variety. In **paralysis of both facial nerves** the patient seems to laugh behind a mask; but, while the face remains immovable, there may be a change of color. In **progressive muscular atrophy** in children there is a peculiar laugh, a sort of risus sardonicus, produced by the action of the buccinator and risorius muscles without the aid of the other muscles ordinarily in play in the expression of joy. In **bulbar palsy** it is exceptional to have the zygomatic muscles affected to any appreciable degree, so that when the patient begins to laugh he may not be able to stop, the mouth remaining open until, perhaps, he uses his hands to close it. In **disseminated sclerosis** the laugh may be spasmodic and last several minutes. It has often been prolonged to the point of exanosis, as noted by Oppenheim, giving rise to a fear of asphyxia. Both laughter and crying in this disease occur without sufficient reason; but crying less frequently than laughter. During laughter the pupils may remain unaltered or become extremely dilated, as noted by Parinaud. The true sardonic laugh occurs in **tetanus**. In **mental affections** unnatural laughter is often a prominent

¹ Thèse de Paris, 1899.

symptom. The two sides of the face during laughter may have different expressions, as is sometimes observed in **epileptic cases**, in **senile dementia**, and in **general paresis**. Fits of spasmodic laughter occur in **hemiplegic patients**, sometimes alternating with crying; and this may also appear in **pseudobulbar paralysis**, presenting a great contrast with the ordinary immobile visage. Patients complain of these outbursts of laughter and find them disagreeable. In **hysteria** laughter may recur at frequent intervals; and Raulin relates the case of a girl of 18, who had a hysteric laugh of 4 months' duration. Hysteric glossolabial hemispasm may also produce a one-sided grimace, such as laughter. The article throughout is abundantly illustrated.

DISEASES OF THE CEREBRAL MENINGES AND NERVES.

Cerebrospinal Meningitis.—William Osler,¹ in the Cavendish Lecture for 1899, presented the subject of cerebrospinal fever, and said that, on the whole, his observations at the Johns Hopkins Hospital and elsewhere supported those of Weichselbaum, Jäger, Heubner, Councilman, and others, that in epidemic cerebrospinal fever there is an organism, with functional peculiarities, which may reasonably be regarded as the exciting cause of the disease, this being the *Diplococcus intracellularis*. He makes the following classification of acute leptomeningitis as a provisional group:

ACUTE LEPTOMENINGITIS.	Primary.	1. Of cerebro-spinal fever.	{ (a) Sporadic. (b) Epidemic.	} Diplococcus intracellularis.
		2. Pneumococcic.	{ Meninges alone involved or in a general pneumococcus infection.	
	Secondary.	1. Tuberculous	{ (a) Secondary to pneumonia, endocarditis, etc. (b) Secondary to disease or injury of cranium or its fossa.	} Bacillus tuberculosis.
		2. Pneumococcic.		
		3. Pyogenic.	{ (a) Following local disease of cranium or a local infection elsewhere. (b) Terminal infection in various chronic maladies.	} Various forms of staphylococci and streptococci.
		4. Miscellaneous acute infections.	{ In typhoid fever, influenza, diphtheria, gonorrhea, anthrax, actinomycosis, and other acute diseases.	
				} Typhoid bacillus, influenza-bacillus, diphtheria-bacillus, gonococcus, etc.

Under the head of symptomatology he points out that a careful study of the blood determined **leukocytosis** in every instance. As a rule, there was no special reduction in the red blood-corpuscles. In 1 case the diplococcus was isolated from the blood during life. Twice, also, he noticed a **periarthrit**, and in 1 of these instances the diplococcus was isolated from the pus of the joints. **Kernig's sign** was present in all of his cases in which it was sought. The sign is obtained by having the patient propped up in bed in a sitting position, when, attempting to

¹ Phila. Med. Jour., June, 1899; West London Med. Gaz., June, 1899.

extend the leg on the thigh, a contracture of the flexors prevents the full straightening of the leg; or in a recumbent posture the thigh may be flexed at a right angle with the pelvis, and then it is impossible to extend the leg upon the thigh. He states that Friis found this sign in 53 of 60 cases, and Netter in 45 out of 50. It is supposed to be due to the irritation of the nerve-roots in the meninges, as extension of the thigh upon the leg when the patient is in the sitting posture elongates, and consequently stretches, the lumbar and sacral roots, already irritated by the leptomeningitis. Regarding **lumbar puncture**, he is inclined to think that in certain instances it may have some therapeutic value; but feels sure that it has great diagnostic importance. Regarding pneumococcic meningitis, he mentions 3 varieties: 1. Meningitis a complication of lobar pneumonia. 2. Pneumococcic meningitis from local infection. 3. Primary pneumococcic meningitis, of which variety, however, he says, no positive evidence can be adduced. In reference to **treatment** he is very brief; he does not mention a single drug, and assumes a very conservative attitude toward spinal puncture, laminectomy, and drainage; finally saying: "On the principle of a desperate remedy for a desperate disease, the operation of laminectomy seems justifiable in certain severe cases in which the spinal symptoms are very marked."

J. B. Herrick¹ furnishes an article on **Kernig's sign** in meningitis. This sign he found present in 17 out of 19 cases of meningitis. In the 2 cases in which it was absent a single examination was made a short time before death, when there was a general relaxation of all muscles. Many patients not affected with meningitis, but presenting other cerebral symptoms, and many healthy individuals were examined for the sign; but it was only found present in 2 out of 100 cases of cerebral disease other than meningitis. Netter² reinforces the value of the sign in the diagnosis of meningitis. Its value has also been confirmed by Henoeh, Bull, Bluemm, Friis, and many others.

Rollston and Allingham³ report a case of **cerebrospinal meningitis**, treated by **laminectomy**, in a man, 24 years old, who was seized with pains and a dull, singing sensation in the ears, deafness, mental wandering, vomiting, delirium, contractures of the limbs and retraction of the head, headache, tache cerebrale, occasional strabismus, pupillary variations and inequalities, and horizontal nystagmus. The patient was steadily growing worse and sinking into a condition of alternating coma and delirium, and it appeared that he would die. An incision 6 in. long was made over the lower dorsal vertebrae, and the laminae of the seventh and eighth were removed. The presenting dura was incised for about 4 in., and 3 oz. of coagulated lymph and cerebrospinal fluid were discharged. A drainage-tube was introduced, and the skin loosely approximated with sutures, under the usual antiseptic dressing. Decided improvement followed; there was a free discharge of clear fluid, necessitating frequent changes of the dressing; and this continued for 3½ weeks, marked by increase of cerebral symptoms whenever the flow was impeded. Later, the temperature remained normal; the discharge diminished, and finally disappeared. The tube was removed on the fortieth day, and the wound was completely healed the following week. [The report does

¹ Am. Jour. Med. Sci., July, 1899.

² Soc. méd. des Hôp., July 22, 1898.

³ Lancet, Apr., 1899.

not indicate the variety of meningitis from a bacteriologic point of view.]

Gynn¹ reports a case of cerebrospinal meningitis in which the **diplococcus** was demonstrated in the cerebrospinal fluid obtained by lumbar puncture, and also in pus from the knee-joint, and finally in the **circulating blood**. At the autopsy the microorganism was demonstrated in cultures from the meninges only. This is the first case in which this microorganism has been found in the blood-stream. [This is probably the same case already mentioned above by Osler.]

Osler² describes a case of cerebrospinal meningitis in which there were **multiple joint-afections**, which developed with rapidity and were severe in character, resembling acute rheumatic arthritis. In this case diplococci were found in the joints, and the joint-affecton seemed to be a manifestation of diplococcus-septicemia rather than attributable to any distinct trophic disturbance arising from the cerebrospinal involvement.

Greiwe, Fackler, Mitchell, and Hellmann³ report 4 cases of cerebrospinal meningitis in which the **Micrococcus tetragenus** was demonstrated as a probable cause. In all 4 cases, in the fresh preparations as well as upon agar-growths and bouillon-cultures, the tetracoccus was found in large numbers.

G. Schirmer⁴ reports 9 cases of this disease, of a grave character, which were successfully **treated by inunctions of unguentum Crede**. Those that were treated at once with inunctions made a prompt recovery; those in which the treatment was not begun early, and which showed severe symptoms, also recovered. No special sense disorder remained. The method of treatment was the inunction of an ounce of the ointment daily for 3 days, followed by $\frac{1}{3}$ oz. at each relapse. Hot-water applications to the spinal column relieved pain; and aseptic cleansing of the nasopharynx, and small doses of trional to relieve restlessness, were used.

C. P. McNabb⁵ reports a case of cerebrospinal meningitis **treated by antistreptococcic serum**. The case occurred during an epidemic, and the diagnosis, apparently, was beyond question. On the fifth day of the illness 10 cc. of antistreptococcic serum were injected into the subcutaneous tissue of the abdomen, and repeated 3 days later. Strychnin and whiskey were also used freely. Great improvement followed, and a slow but satisfactory convalescence took place. In a second case, of the most severe type, death occurred, though injections of the serum were followed by temporary improvement.

Cerebrospinal Rhinorrhea.—St. Clair Thomson⁶ has collected cases in which the cerebrospinal fluid has escaped through the nose, apparently without detriment to the general health in most instances. He finds 8 undoubted cases, and 12 others probably of the same nature.

¹ Phila. Med. Jour., vol. ii., No. 24.

³ Phila. Monthly Med. Jour., Sept., 1899.

⁵ N. Y. Med. Jour., Feb. 25, 1899.

² Boston M. and S. Jour., Dec. 29, 1899.

⁴ N. Y. med. Monatsch., No. 11, 1898.

⁶ The Cerebrospinal Fluid, London, 1899.

DISEASES OF THE CRANIAL NERVES.

W. von Beehterew¹ reports a case of **recurrent ocular palsy**, presenting the peculiarity of being bilateral, occurring in a woman who, years before, had had ear-disease and meningitis. Relief followed persistent treatment by mercury and potassium iodid. He believes that recurring ocular palsy, which usually affects mainly the third nerve, is invariably organic in character.

J. Roux² discusses the subject of the **double cortical origin of the oculomotor nerve**, making reference to the experiments of Schäffer, Unverrich, Danillo, Munk, and others, indicating that there is motor function in the occipital cortex, close to the half-vision centers, and he also refers to the well-known fact that irritation of the foot of the second temporal convolution causes conjugate deviation of the eyes to the opposite side. He concludes: First, that anatomy, experimentation, clinical observation, and pathology are in accord in showing that the eye possesses 2 cortical areas for motion: the first, in the anterior oculomotor center, corresponding to the projection-zone of general sensibility, situated at the foot of the second frontal; and second, a posterior oculomotor center corresponding to the sensory projection for sight in the region of the internal inferior surface of the occipital lobe. Second, that each of these centers acts bilaterally, and holds in its control not only the muscles innervated by the oculomotor nerves, but also the orbiculares of the eyes; that is to say, the entire motor apparatus of vision. Third, an isolated lesion of the anterior oculomotor center causes: 1. Conjugate deviation of the eyes. 2. Slight disturbance of lid-movements. Fourth, an isolated lesion of the posterior oculomotor center produces conjugate deviation of the eyes and hemianopsia. Fifth, ptosis of cortical origin may be due to a simultaneous lesion of the 2 oculomotor centers of the same side. Sixth, a bilateral or symmetrical lesion affecting the 2 anterior oculomotor centers or their projection-fibers produces a clinical picture marked by abolition of voluntary movements of the eyes and of the lids, with preservation of reflex coordinating movements, which remain under the control of the uninvolved posterior oculomotor centers.

Optic Neuritis.—W. G. Sym,³ in a study of retrobulbar neuritis, makes the following classification: 1. Unilateral optic neuritis may be due (*a*) to encroachment of a local inflammation; (*b*) syphilis; (*c*) rheumatism; (*d*) gout; (*e*) malaria. 2. Bilateral optic neuritis is (*a*) associated with diseases of the spinal cord, especially tabes, disseminated sclerosis, and parietic dementia; (*b*) cases occurring without any relation to cord-lesions, in some of which, however, cord-lesions subsequently develop; (*c*) cases that might be designated stationary scotomatous atrophy, sometimes presenting a history of meningitis or of periostitis at the apices of the orbits or in that neighborhood; (*d*) cases of hereditary optic atrophy manifesting itself among the males of the family as they attain the age of 18 to 23; the daughters are usually free, but may transmit it to their sons, and both daughters and sons of patients may, and usually do, remain free; but the daughters may transmit it to their sons, the liability usually disappearing in the third generation; (*e*) cases of toxic amblyopia,

¹ Deutsch. Zeit. f. Nervenhe., Dec., 1898.

² Arch. de Neurol., Sept., 1899.

³ Am. Jour. Med. Sci., Feb., 1899.

such as tobacco-blindness; though the author doubts that this is a neuritis in the strict sense of the term. Nothing new in the way of treatment is suggested.

Facial Paralysis.—M. Bernhardt¹ discusses the **recurring form** of facial paralysis, and concludes: 1. Recurring facial palsy occurs in about 70% of all facial paralyses. 2. Men are more commonly affected than women. 3. Recurrence takes place as often before 20 as after 50 years, and most frequently between 20 and 50, the most common period of peripheral facial paralysis. 4. Recurrence may take place after a few weeks or after many years. 5. A second recurrence in no case has appeared before the first year, the most of them in from 5 to 7 years and more. 6. The first effect sought is generally the location of the recurrence. 7. In the majority of cases only 1 recurrence was noted, most rarely a second, much more seldom a third and fourth. 8. The first recurrence in the majority of cases is usually more severe than subsequent attacks. 9. In about 10% of recurring facial palsy there is an inflammatory or purulent process in the middle ear. 10. Another class of recurrent facial palsies is due to syphilis—about 6.6%. 11. A third class is due to diabetes—about 5%. 12. A fourth class—about 13.3%—is found in those who have a neurotic predisposition. 13. In 66.6% none of the above causes can be recognized. 14. The hypothesis that peripheral facial palsy is an infection- or intoxication-disease is open to doubt.

DISEASES OF THE BRAIN PROPER.

G. Flatau² reports 4 cases of **acute nonsuppurative encephalitis**. H. Oppenheim³ reports the case of a 16-year-old anemic girl, who complained of headache for a week, with loss of appetite, followed by an increase of headache, vomiting, vertigo, chills, and fever, after which paresis of the left abducens appeared, with tenderness upon pressure on the left side of the neck and of the head, leading to the idea of sinus-thrombosis. An operation was done, including exploration of the mastoid and puncture of the sinus, with entirely negative results. Four days after this operation complete motor aphasia and monoplegia of the right face and arm, with modification of sensibility, appeared. The eye-grounds remained normal. At this point Oppenheim made a diagnosis of nonpurulent encephalitis, and the patient improved for a number of days. The mind cleared, the fever subsided, the paresis lessened, and the aphasia improved, so that convalescence was considered established. The operation wound did not heal readily, and there was escape of cerebrospinal fluid through the dressing. About a month after the operation the headache and vertigo returned. Exploration of the wound uncovered diseased bone; and its removal and the clearing out of the sinus-tract resulted in improvement; but the patient finally succumbed to a cerebrospinal meningitis of suppurative character. Section disclosed purulent cerebrospinal meningitis, with accumulation of pus in the spinal cord and the posterior cranial fossa. Macroscopically, the brain-substance was intact; but microscopically, foci of subcortical sclerosis were found in the

¹ Neurol. Centralbl., 1899.

² Berlin. klin. Woch., May, 1899.

³ Deutsch. Zeit. f. Nervenhe., June, 1899.

left frontal convolutions and in the foot of the anterior central convolution of the left side. [The report seems to prove the curability of non-suppurative encephalitis in a case that was proved to be such by the post-mortem and microscopic examination.]

I. Piperkoff¹ describes a case of **repeated attacks** of acute encephalitis. After a lengthy study of the case he reaches the following conclusions: 1. There undoubtedly exists an acute encephalitis occurring in patches, which is spontaneous, non-suppurative, and not hemorrhagic. 2. This form of acute spontaneous encephalitis corresponds to the experimental variety of Coen. 3. Small patches of softening may result. 4. Patches of acute encephalitis may coincide in the same case with patches of subacute encephalitis presenting merely an attenuated form.

Cysticercus Cellulosæ of the Brain and Spinal Cord.—1.

B. Diamond² reports a case of this extremely rare form of parasitic disease. From the literature of the subject he can find but 8 other American instances, although in European countries, especially Germany, it is not infrequent. The case was that of a married woman, of German birth, 34 years old, who, from the age of 16, 4 years before leaving Germany, had epileptoid seizures at each menstrual period. These were preceded by a protracted warning, enabling her to undress and retire to bed. The convulsive manifestations lasted a considerable number of minutes, and usually she was prostrated for a number of days thereafter. Previous to entering the hospital, the convulsions had come on as usual, but persisted in a sort of status occurring every half-hour; and she was admitted to the hospital comatose, with stertor, contracted pupils, dry tongue, and some albumin in the urine, which contained a few hyaline casts. After 3 days she died. On section, the thymus gland was represented by a mass of fat containing a considerable amount of tissue. Scattered over the surface of the brain and spinal cord were globular cysts, with clear contents, and shrunken, yellowish, irregular granular smaller masses. These cysts and masses were found embedded in the brain, clothed with pia, and adherent. The brain was also riddled with similar cysts. Examination by Hektoen, at the Rush Medical College Laboratories, demonstrated the cysticercus in the globular cysts. The author says in the summary that it is probable, from the clinical history, that the condition was of many years' duration, and would trace the invasion to at least the age of 16, when the convulsions first appeared.

Brain-tumor.—H. C. Gordinier,³ in a case of agraphia, apparently demonstrates that movements for writing have a distinct cortical depot, located at the base of the left second frontal convolution in right-handed individuals. The patient, who gave symptoms of tumor and an aphasia that was limited to **agraphia** only, on autopsy presented a new growth occupying the foot of the second left frontal convolution, distinctly separated from the arm-area by the precentral sulcus. The growth was irregular in outline, elevated $\frac{1}{2}$ cm. above the surrounding cortex, and of a firm consistency. Its longest diameter was 2 cm. The author believes there can be no room for doubt that in this case the complete agraphia was due to destruction of the base of the second left frontal convolution, and that the slow cerebriation and frontal ataxia which developed late in

¹ Arch. de Neurol., 1898.

² Jour. Am. Med. Assoc., June 17, 1899.

³ Am. Jour. Med. Sci., May, 1899.

the case were due to extension of the process deeper into the frontal lobe. There was also paralysis of the right external rectus oculi muscle, which is supposed to have been due to involvement of the area for the movements of the eyes and head.

Claribel Cone¹ reports upon a polymorphous cerebral tumor which presented **several histologic types**—carcinoma, sarcoma, and glioma—with transitions between the different histologic varieties, indicating that all must be regarded as different modifications of the same kind of growth. In addition there was tuberculous infiltration, which she would attribute to the tumor presenting a locus of lessened resistance. J. J. Putnam and M. H. Richardson² report a case of **extensive cerebral sarcoma** extirpated with benefit. There was recurrence, and death at the end of 6 months. The authors emphasize the advantages of palliative operations in cerebral tumors otherwise inoperable. Archibald Church³ reports a case of cerebellar tumor in which the **x-ray was used**, and pictures produced which clearly indicated the location of the tumor. The patient died suddenly, and a large lobulated glioma was found in the cerebellum, filled with a recent clot and the stains and pigments of a number of old hemorrhages. The author is of the belief that in highly vascular tumors or nodules which present a considerable variation in their physical characters from the surrounding brain-substance the x-ray may be of diagnostic service. [Another case has been observed in the practice of Carl Beck of Chicago, in which the x-ray was of signal service in localizing the tumor.]

Charles A. Beevor⁴ introduced a discussion of the subject of brain-tumor located **outside of the motor tracts**, pons and medulla, which was continued by a number of other members of the London Neurological Society. Beevor stated that there were no definite symptoms of **tumor of the corpus callosum**; but the late Dr. Bristowe, as quoted by Sharkey, insisted that tumors in this location were characterized by the gradual onset of hemiplegia, diplegia, stupidity, drowsiness, cessation of speech, difficulty of swallowing, and absence of implication of the cranial nerves. In a case recalled by Sharkey, the patient presented a placid coma, which extended over several months; and Pitt recalled another, in which there was protracted stupor. Schuffer⁵ has collected 25 cases of **tumor of the corpus callosum**. Most of the cases occurred after 40. The average duration was under a year. Headache was absent in 11 cases, and vomiting in 15 cases; optic neuritis was observed in 10 cases, absent in 7, and not looked for in the others. The mental state was always changed, generally in the direction of weakness of memory, somnolence, etc. Convulsions occurred in 11 cases. Disturbances of sensibility were rare. Mental changes appeared to be more constant in tumors of the corpus callosum than in tumors of other parts of the brain. In cases of brain-tumor presenting no localizing symptoms and increasing failure of the intelligence, tumor of the corpus callosum, therefore, should be borne in mind. Marcus Gunn took up the subject of **optic neuritis**, and based his argument upon the tabulation of J. M. Martin.⁶ He inclined to the idea that when the choked disk was unilateral or most pronounced

¹ N. Y. Med. Jour., Mar. 25, 1899.

² Am. Jour. Med. Sci., Feb., 1899.

³ Rev. Spérimentale, vol. xxviii., f. 2.

⁴ Boston M. and S. Jour., Feb. 9, 1899.

⁵ Brain, No. 3.

⁶ Lancet, July 10, 1897.

on one side, it was due to mechanical pressure of the tumor on the corresponding side of the brain; and this was found to be true in 8 cases of frontal tumor and in 4 cases of temporosphenoidal growth out of 14 all told. Tumors in the parietooccipital lobes and in the cerebellum presented unilateral neuritis in 10 cases—5 on the same side and 5 on the opposite side. In the cases presenting gradual onset of the papillitis on one side, it was observed much more frequently in tumors of the cerebral lobes than in growths affecting the cerebellum; namely, in 20% of all instances of neuritis in cerebral tumor. He was inclined, therefore, to the belief that the process is one of extension by contiguity. Further, he believes that intense double optic neuritis, with much swelling and surrounding retinal change, coming on quickly, suggests its origin in the cerebellum; that one-sided optic neuritis or marked difference in intensity suggests the cerebrum, and is probably in favor of the tumor being on the same side as the excess of neuritis.

E. S. Reynolds,¹ in a discussion of the diagnosis of brain-tumor, groups the *uncertainties* into 2 large classes: 1. When no tumor exists. 2. When a tumor is present, but symptoms are ascribed to some other disease. Conditions which may be confounded with tumor are: First, chlorosis, in which optic neuritis may appear and be associated with intense headache, and even with hysteric motor and sensory symptoms. Second, uremia, which often presents intense headache, optic neuritis, convulsions, and coma. A unilateral form of uremic convulsions, with cerebral hemorrhage, has been noted by Broadbent. Third, chronic lead-poisoning, with lead-encephalopathy, presents convulsions, delirium, sometimes acute mania and coma, with optic neuritis and severe headache. To this may be added hemianesthesia and cranial nerve palsy. Fourth, hysteria may simulate brain-tumor, especially when there are headache, vomiting, convergent strabismus, and various motor and sensory disturbances. Fifth, so-called reflex epilepsy, with unilateral convulsions. Sixth, many anomalous cases in which symptoms appear apparently due to gross disease of the brain-cortex, and in which the patients have recovered without operation or after an operation which discovered nothing. Seventh, syphilis of the cranial nerves, with severe headache, but without cortical irritation. Eighth, meningitis or brain-abscess may be mistaken for tumor, especially if there is slight optic neuritis, if the symptoms have a slow onset, and there is apparently no cause for the meningitis or abscess. Ninth, polioencephalitis may simulate pontine tumor. In the second class, symptoms of brain-tumor mistaken for other diseases, he lists, first, hysteria, especially when occurring in young girls, without optic neuritis or paralysis of the cranial nerves; and he lays stress upon the likelihood of the association of hysteria with organic brain-disease. Second, reflex epilepsy. Third, hydrophobia. Fourth, senile dementia. Fifth, arterial changes, especially in old people. Sixth, ear-disease. He further discusses the uncertainties in the diagnosis of cerebral tumors and the uncertainty of the nature of the tumor; and he concludes that it will be seen how difficult it may be for a neurologist to give an accurate opinion on the precise locality and nature of a brain-tumor, and that the difficulties and uncertainties of brain-surgery are not

¹ Brit. Med. Jour., Feb. 11, 1899.

so much those of surgical technic and untoward after-effects as perplexities at the outset.

L. Bruns,¹ in his treatise on tumors of the nervous system, while covering the entire subject thoroughly, notes the following interesting points: In the pathology of brain-tumors he would differentiate gliomas entirely from sarcomas, on the ground of their origin from ectodermal cells histologically, and dwells especially upon their infiltrating character, which enables them to invade large portions of the encephalon without giving rise to much disturbance of brain-activity. He would exclude **trauma** as a cause of brain-tumor except in syphilis and tubercle, where it may form a locus of minor resistance and thereby determine the syphilitic or tuberculous process. He accepts the mechanical theory of the origin of **optic neuritis**, and believes that the recession of the papillitis subsequent to trephining proves the contention. In regard to symptoms, he lays especial stress upon the localizing value of the so-called general symptoms; for instance, early internal hydrocephalus due to tumors in the posterior fossa. The characteristic **mental change** in brain-tumors he considers to be mental dulness and stupidity. **Local tenderness** over the region that other signs indicate as the seat of the tumor is an excellent guide to localization, and tends to show that it is in or near the cerebral cortex or membranes, although the tumor may be deep-seated. A **tympanitic** or **cracked-pot percussion-note** may also be met with; and these signs he considers important, as corresponding to the position of the tumor. He holds that with tenderness and a tympanitic or cracked-pot sound, when other symptoms indicate the motor convolutions as the seat of the tumor, the presence of these 3 in a neighboring area would indicate the proper point for operation; but it must be remembered that tympany and cracked-pot sound are common to children. Tumor of the **optic thalamus**, he thinks, can be diagnosed with some probability, if there are hemiplegia, disturbance of sensibility, hemiopia, and one-sided athetosis and paralysis on the same side of the face for emotional expression, but not for voluntary movement. He denies any particular change in the mental condition of the patient due to tumors of the **prefrontal area**; but he lays stress, as an aid to diagnosis, on the hilarious or humorous state, and on ataxia, which may be observed in tumors in this location, the main difficulty being to differentiate a frontal growth from cerebellar tumor. He recognizes 2 forms of disturbance of **gait**: First, the drunken gait; and, second, a gait like that of locomotor ataxia, which is usually attributable to disturbance of the vermis, but may be produced by tumors of the cerebellar hemisphere if they encroach upon the middle lobe. He thinks that a **diagnosis** of intracranial growth may be made with certainty in about 80%. Surgical **treatment** is the only one discussed, and he finds that in only about 8% of all cases can the position of the tumor be correctly diagnosed, found accessible, and the growth completely extirpated. Of this number, about one-half appear to be successful, practically the 4% of Oppenheim. Ferrier's statistics, however, give a much better percentage. He would not operate in cerebellar tumors, except by trephining, to relieve pressure; but he thinks that intracranial syphilis is open to operative interference, as gummatous processes are very rarely cured by treatment.

¹ Die Geschwülste des Nervensystems, Berlin, 1897.

Philip Coombs Knapp¹ presents a most exhaustive tabular study of **cerebral tumors**. He states that the statistics of operative treatment of *gummas* are better than for any other form of growth; out of 10 cases only 1 died. The results of operations in *tuberculous growths* is also good, in spite of the adverse advice of Bergmann in relation to attacking both these neoplasms. The greatest danger, from an operative point of view, is presented by the forms of tumor which have been most frequently operated upon; namely, *sarcoma* and *glioma*, owing to their infiltrating character and tendency to recurrence. He summarizes the results of surgical intervention in cerebral tumor by saying that the outlook is discouraging. About five-sixths of the cases of persistent headache are relieved by trephining—at least temporarily. The chances of complete recovery after such an operation are very small; in probably less than 10% is the growth entirely removed. The rest of the cases linger on, paralytic or epileptic or blind, and usually succumb to a recurrence of the growth. Nevertheless, there is a small chance that the operation may effect a complete cure or give permanent relief. With that chance, though small, the operation becomes justifiable, and the sooner it is done the greater the prospect of permanent benefit. Constant increase in operative skill will also add to the good results.

Thomas Oliver and George E. Williamson² report 2 cases of brain-tumor successfully removed by **operation**. In the first case a combination of anesthesia and muscular spasm assisted in the diagnosis of the growth in the motor cortex; and this, with others, serves to prove the contention that the zone is sensorimotor. In the second case the tumor was a simple angioma.

Bruno Kallmeyer³ reports a case of solitary tubercle of the cerebellum which had entirely healed. The patient subsequently died of chronic interstitial tuberculous pneumonia and acute purulent meningitis.

Hemiplegia.—C. L. Allen⁴ calls attention to **edema of the paralyzed limbs** in a hemiplegic, reporting it as an unusual case. This emphasizes the fact that edema of the paralyzed members is not sufficiently brought out in the teaching of the subject, although every physician of experience must have seen cases in which edema was present. The author, in a search of the literature, found comparatively few instances reported. He states that there is no satisfactory explanation of the localized edema, but in the majority the brain-disease was of large extent. Loss of power in the muscles and failure of vasomotor control, he thinks, would be responsible for the production of stasis and edema of the paralyzed side; but why this so rarely occurs he is unable to explain.

CEREBRAL DISEASE.

Karl Kompe⁵ gives his reasons for thinking that epistaxis may be an early symptom of arterial sclerosis as a forerunner of cerebral softening. It is established that sclerotic changes are likely to occur early in the carotids, especially the internal, and readily pass along into the ramifications, including the ethmoidal artery and the sphenopalatine, whence

¹ Boston M. and S. Jour., Oct., 1899.

² Brit. Med. Jour., Nov. 26, 1898.

³ Berlin. klin. Woch., Jan. 2, 1899.

⁴ Jour. Nerv. and Ment. Dis., Aug., 1899.

⁵ Arch. f. Larynx., Band 9, 1899.

arises the frequent epistaxis. [The occurrence of protracted epistaxis after the age of 50 should therefore lead to a thorough investigation of the arterial condition and the institution of proper treatment for the arteriosclerosis, which in the early stages is fairly amenable to management.]

C. Mirallie¹ makes a study of the **facial palsy** that occurs in hemiplegia, with particular reference to the upper portion of the face. He reaches the following conclusions: 1. In every hemiplegia of cerebral origin, paralysis of the upper facial is the rule whenever the inferior facial is paralyzed. 2. This paralysis of the upper facial is always less accentuated than that of the inferior portion, and much less than in a peripheral facial paralysis. 3. In hemiplegia, paralysis of the upper facial is, so to speak, latent, and requires investigation. 4. The retraction of the palpebral opening on the paralyzed side can only be explained by the participation of the oculomotorius. 5. The relative integrity of the upper facial, and especially of the oculomotorius, depends physiologically upon the synergic action of these nerves.

Gilles de la Tonrette² insists that the **temperature** is one of the best guides to diagnosis in comatose patients. In cerebral hemorrhage the temperature falls at once to 97° F., or lower; but in 3 or 4 hours, or even earlier, it may rise to 100° or 102° F. Recovery may be expected if it does not exceed 102.2° F. [He fails to mention the important fact that the paralyzed side shows an excess of 1° to 5° F. over the sound side in the early hours of the disease.]

A. H. Tubby³ reports a procedure for correcting the pronated and flexed attitude of the upper extremity resulting upon infantile hemiplegia. The purpose of the **operation** is twofold: First, to lessen the power of the flexors and pronators; and second, to transfer some of the pronating force in such a way as to make it a supinating force. The operation consists in transferring the pronator radii teres, from its insertion into the radius, through a slit in the interosseous membrane, around the posterior and external border of the radius, so that its contraction turns the hand outward instead of inward. At the same time, he divides the flexor carpi radialis, which serves both to flex the wrist and to pronate the hand. The other contracted tendons at the wrist are also divided, and the hand is put up in a moderately flexed position, which, by successive dressings, is gradually brought into full extension, thus producing elongation of the contracted tendons. He claims brilliant results in 2 cases. For the technic and details of the operation, the reader is referred to the original communication.

Byrom Bramwell⁴ reports a case of **aphasia** due to softening of Broca's convolution, and coming on suddenly. The symptoms were mainly those of visual aphasia, the patient being only deprived of motor-vocal speech for a few hours, and thereafter having full emissive control of the vocal apparatus, except in regard to proper names. He was unable, however, to name objects or persons, and presented some agraphia and some alexia. Bramwell draws the conclusion that in this instance the right-sided frontal convolutions must have been more active than is ordinarily the rule in right-handed individuals, so that there was a competent

¹ Arch. de Neurol., Jan., 1899.

³ Brit. Med. Jour., Aug. 19, 1899.

² Sem. méd., June 8, 1898.

⁴ Brain, iv., 1898.

area for vocal-motor speech on the right side. The visual disturbance is attributed to interference with the connecting routes between the visual and the vocal-motor centers of speech.

James S. Collier¹ reports a case of left-sided brain-lesion, unattended by **aphasia**, in a right-handed woman, and is inclined to accept the hypothesis put forward by others, that in some right-handed persons the educated speech-centers are on the right side. His case, unlike some that have been reported, presented no left-handedness anywhere in the family.

Cerebral Contusion.—A. I. Bouffler² takes up the subject of cerebral contusion, a condition of the commonest occurrence, and occupying a position midway between concussion and a laceration. His well-taken conclusions are as follows: 1. The term "cerebral concussion," as generally employed, is indefinite and unsatisfactory, and inconsistent with modern ideas of pathology and precision. 2. The term "cerebral concussion" should be limited to those phenomena resulting from disturbance of the function of the brain by trauma, without the production of gross mechanical lesions of the brain. 3. The slightest manifestation of concussion is due to disturbance of the fluid equilibrium of the brain, and is always of momentary duration and effect. 4. More severe concussion produces spasm of the vasomotor system, and results in the production of signs and symptoms identical with and undistinguishable from those of shock, and which persist until the circulatory equilibrium is restored, and not thereafter. 5. The gross mechanical lesions of the brain produced by truma, with or without fracture of the skull, are identical with those of contusion elsewhere. 6. The clinical history corresponds with what we should naturally expect from a contusion of tissues of such delicate structure and of such specialized function with such anatomic relations. 7. The treatment of contusion of the brain is the same as that of contusion elsewhere, with the special demand for early treatment of complications. 8. The term "cerebral compression" indicates a mechanical disturbance of the circulation of the brain by any lesion that materially increases intracranial tension.

J. W. Courtney,³ in a very careful study of the alleged condition of **traumatic cerebral edema**, based upon numerous cases and much literature, finally reaches the following conclusions: 1. That traumatic cerebral edema can find no place as a pathologic or clinical entity. 2. That it is primarily the inevitable sequence in time of that complex of pathologic conditions which we designate contusion. 3. That inasmuch as contusion of the brain and its meninges is most commonly met with as a concomitant lesion to the more macroscopic lesions designated hemorrhage and laceration, the primary seat and extent of its accompanying edema will be largely fortuitous. 4. That in the rare instances in which the application of a traumatizing force is expended in the production of a local contusion of the brain-cortex or its meninges, the brain itself is abundantly able to rid itself of the edema through its venous channels. 5. That in the remaining cases in which the contusion is primarily extensive in the cerebrum, or when it affects the cerebellum or bulb, the factors that enter into the mechanism of the production of the edema are such as

¹ Lancet, Mar. 25, 1899.

² Phila. Med. Jour., Oct. 20, 1898.

³ Boston M. and S. Jour., Apr., 1899.

to preclude the possibility of operative relief. 6. That contusion can *per se* easily cause death. 7. That death in such cases results from anemia of the bulb.

Cerebral Abscess.—Guy Hinsdale¹ reports an interesting case of purulent encephalitis and cerebral abscess in a newborn child, arising from umbilical infection. The author thinks that, with one exception, it is the youngest instance of such disease. The infection was probably of intra-uterine origin.

Joseph Collins,² in an article on the **treatment of abscess** of the brain, says: "It will be seen that a brief retrospect of the more important literature on brain-abscess for the past year shows a deplorable mortality. The most potent factor in contributing to this frightful mortality is the failure to recognize the existence of abscess of the brain before it has produced either septic complications or profound exhaustion. Surgical technique has apparently very little, if anything, to do with it. The mortality-rate of brain-abscess will drop just in proportion to the earliness of recognition and the courage of the physician in directing the surgeon to seek for it, even though there be no exact localizing symptoms. Abscess of the brain secondary to middle-ear disease is located, in the vast majority of cases, either in the temporal lobe or in the cerebellar hemisphere of the same side. When one is reasonably sure of the existence of brain-abscess, no hesitation should be had in exploring, first, one of these regions, and then, if it is not found, the other. Delaying the operation until the appearance of unequivocal localizing symptoms, or procrastinating by operating on the mastoid after symptoms of brain-abscess are evident, when one is reasonably assured that abscess exists, is a far greater injustice to the patient than subjecting him to an exploratory trephining."

J. O. Green,³ in an article entitled "**Abscess in the Cerebellum**, from Infection through the Labyrinth," makes a careful study of the subject, with tabulated analyses of the symptoms, and much other matter of importance. From analyses of the symptoms in the 4 cases detailed in the article, he states that in all a chronic tympanic suppuration was running its course without other symptoms than otorrhea, when there was a sudden attack of vertigo, followed by pain in the depth of the ear. This was in 1 accompanied by a marked increase in the deafness. In all 4 headache was a prominent symptom; it was bilateral in 2 cases, being frontal in 1, vertical in the other. In none was there any complaint of the occipital region. Paralysis of the abducens occurred in 2, 1 being bilateral, 1 unilateral and on the side opposite from the ear-disease. Optic neuritis was present in but 1 case. One case presented facial paralysis, from disease of the nerve and the Fallopian canal, by extension of the inflammation from earious destruction of a part of its wall. In 1 case there was general septicemia; in the others, fever was absent to the end. Nystagmus on looking away from the diseased ear was present in 1 case. Sclerosis of the bone existed in all 4 cases. The cerebellar abscesses were of about equal size, situated in the anterior lower portion of the cerebellum on the same side as the ear-disease; and in all 4 cases an accurate diagnosis before operation was impossible. In 3 of the cases in which examination was made, leukocytosis was found; but the author, in a note, refers to an observation reported to the Boston Society

¹ Am. Jour. Med. Sci., Sept., 1899.

² Ibid., Apr., 1899.

³ Ibid.

of Medical Sciences, Nov. 18, 1898, in which leukocytosis was found in 79.5% of uncomplicated tympanic suppurations. It therefore fails to be of diagnostic value in brain-abscess.

Hydrocephalus.—L. Dastros,¹ in a monograph on this subject, enters into a full discussion of the accumulation of large quantities of fluid within the skull. Tables give the circumferential measurements of the skull from birth up to adult life, and serve as a basis for comparisons in cases suspected of being hydrocephalic. Regarding **treatment**, nothing particularly new is brought forward, but the author clearly shows that spinal puncture, which has been suggested by a number of independent workers, will ordinarily fail, owing to closure of the foramen of Magendie, or because of plastic exudate about the foramen magnum, cutting off the spinal from the ventricular cavities.

Asthenic Bulbar Paralysis.—H. Senator² describes a case suggesting causal relationship between asthenic bulbar paralysis and blood-changes due to multiple myeloma. Lichtheim, Minnich, Nonne, and others have proved organic changes in the nervous system subsequent to severe anemia; and Senator believes that in the present case organic changes might have taken place had the patient lived longer. Referring to the case of Laquer, in which asthenic paralysis was ultimately followed by progressive muscular atrophy, Oppenheim suggested that asthenic paralysis might occur in connection with other tumors and diseases besides myeloma; and Remak referred to a case of associated Graves's disease.

Cerebellar Disease.—Alexander Bruce,³ in considering the subject of **localization and symptoms** of disease of the cerebellum, calls attention to the fact that late observations show that tumors may be situated in the vermis or middle lobe without causing any symptoms of cerebellar ataxia or disturbance of coordination. After further considering this subject, and setting forth his experimental and clinical proof, he says: "We may expect disturbance of equilibrium to be produced by lesions situated within the area bounded by the intracerebellar path of the 2 inferior peduncles of the 2 superior peduncles, and the dentate nuclei in which the latter arise. This area contains the middle lobe and the cerebellovestibular tracts from the roof-nuclei to the nucleus of Deiters. Lesions within this area may produce no disturbances, provided they are symmetrically situated with reference to the mesial plane; and especially if their growth is so slow that compensation is established *pari passu* with the disturbances they may tend to cause." The reader is referred to the original article for an elaboration of this conclusion.

Gas-cavities in the Brain.—R. Reuling and A. P. Herring⁴ report a case of cavities in the brain produced by the *Bacillus aerogenes capsulatus*. The patient was an adult colored woman, who had received a gunshot wound of the abdomen, for which laparotomy was successfully done. Everything appeared to be going well, when, on the third day, she failed rapidly, and died in a few hours. The autopsy was made 24 hours later. The right hemisphere presented a large cavity involving the external capsule, being 5 cm. long, 1 cm. broad, and 2 cm. deep, lined apparently with a smooth, glistening membrane, which contained a small amount of bloody serum. Throughout the lenticular nucleus small cav-

¹ Paris, 1898.

² Berlin. klin. Woch., Feb. 20, 1899.

³ Brit. Med. Jour., May 6, 1899.

⁴ Bull. Johns Hopkins Hosp., Apr., 1899.

ities were found; and a number of others were present in various portions of the brain. Sections examined by Barker presented the gas-forming bacillus, which had undoubtedly caused the cavities mentioned. In no portion of the specimen were there changes of an inflammatory character. The gas apparently had pressed back the tissues of the brain. W. T. Howard¹ reports another case, occurring in a young man, who had peritoneal fistula, for which an operation had been done. A few days after the operation the patient became unconscious, developed symptoms of meningitis, and died. The temperature after the operation ranged from 99° to 104° F., and reached 105° F. before death. Autopsy was made within 10 hours. A number of abscesses were found in the brain, and the lenticular nucleus of the left side contained a number of small smooth-walled gas-cysts; the vessels of the spinal pia and arachnoid contained gas-bubbles, and in the membranes of the cord there were gas-cysts. Preparations made from lungs, heart, vena cava, portal vein, pelvic veins, liver, cerebral and spinal exudates, and the brain-abscess showed the *Bacillus aerogenes* in great number and pure culture. These were cultivated by animal experiments, and conformed in all respects to the *Bacillus aerogenes capsulatus*.

DISEASES OF THE SPINAL MENINGES AND SPINAL NERVES.

Spinal Meningitis.—Starck² reports a case of meningitis, with typical measles, in a girl of 8 years. All movements of the arms and legs were followed by painful muscular spasms. The neck was stiff, there was great cutaneous hyperesthesia, the head was slightly retracted, and there was retention of urine which lasted several days. Ultimately the patient made a good recovery. The author has been unable to find a similar case after an exhaustive examination of the recorded complications and sequels of measles.

Sciatic Neuritis.—J. C. Renton³ reports 8 cases of chronic sciatica in which operation was done for the purpose of exposing the sciatic nerve and breaking up surrounding adhesions, the result of the perineuritis. He believes that small adhesions may disappear, but large ones are more or less permanent, and that nerve-stretching is of no particular service; these adhesions must be dissected out. In cases of 3, 4, and 7 years' duration the operation was efficient, bringing complete restoration to strength and freedom from suffering. [Without questioning the efficacy of such operations, it is more than probable that manipulations combining passive stretching of the nerve over the neck of the femur, vigorous massage of the nerve in chronic cases, and the procedure of Negro, as described in previous issues of the YEAR-BOOK, will accomplish similar results.]

Bilateral Brachial Polyneuritis.—Menz⁴ describes a case in a man of 42, who had suffered from phthisis for some years. Suddenly one night he was seized with severe pain in one arm, which became almost completely paralyzed; later, the other arm was gradually affected in the same manner. These bilateral partial paralyses of the brachial plexus

¹ Bull. Johns Hopkins Hosp., Apr., 1899.

² Brit. Med. Jour., Nov. 5, 1898.

³ Jahrb. f. Kinderh., vol. xlvii.

⁴ Berlin. klin. Woch., June 13, 1898.

are rare. Cases reported by Bernhardt and Remak were traumatic in character. Two cases reported by Heyse and Krafft-Ebing occurred in connection with phthisis and pneumonia, respectively. A case reported by Leszynsky occurred during pneumonia. [The mechanism of bilateral brachial neuritis is generally one of inflammatory extension from the lung-area.]

Nerve-transplantation.—Reuben Peterson¹ reports a case in which the sciatics of a dog were successfully transplanted between the severed ends of the median and ulnar nerves of a man, a number of months after an injury by a circular saw, which had severed the nerves and a number of tendons, as well as the ulnar artery. Marked trophic changes had developed in the hand, which, in other respects, presented the usual deformities. A good result was obtained. The author then discusses the literature of the subject, and tabulates the small number of reported cases in which such a course has been pursued. His conclusions are as follows: 1. Transplantation of a peripheral nerve-segment to bridge over a gap between the 2 ends of a resected nerve is a legitimate surgical procedure. 2. Under favorable conditions, at least partial, and at times complete, restoration of sensation and motion may be expected to follow the operation. 3. Regeneration of the degenerated peripheral end is due to down-growths from the axis-cylinders of the central end. 4. From the slowness of this process, the longer the time after operation the more favorable will be the results. 5. Sensation may return very early after operation, and, as a rule, precedes return of motion. 6. This rapid return of sensation is not due to down-growth of the axis-cylinders nor to conductivity of the transplanted fragment, but must be explained by collateral nerve-supply. 7. In many cases very early return of motion after transplantation may be due to vicarious movements of other muscles than those formerly paralyzed, and not to regeneration of the latter's nerve-supply.

Multiple Neuritis.—H. Sinigar² reports 2 cases of multiple neuritis with **eye-symptoms**. The first occurred in a painter, who also was a hard drinker, but gave no history of lead-colic nor palsy, and denied syphilis. The facial muscles were totally paralyzed, but the muscles of mastication were not affected. The tongue could be protruded feebly, and there was some pharyngeal difficulty, shown by an inability to raise mucus. The muscles in the extremities were weak, showing slight foot-drop and wrist-drop. There were no sensory nor sphincter disturbances. The facial muscles did not respond to faradism, but those of the limbs did. There were double ptosis and complete paralysis of the external muscles of the eyeball on each side. The pupils were small, the left a little larger than the right, both reacting to light and accommodation. Ophthalmoscopically, there was slight blurring of the nasal side of each disk, but no neuritis. He made a complete recovery. [This was probably a case of asthenic bulbar paralysis.] The second case developed a multiple neuritis, following an attack diagnosed as influenza. There were muscular tenderness and weakness; his speech became thick, and the iodid affected him unpleasantly. The eyes moved freely in all directions, but he was unable to close the lids, both facial muscles being involved, so that he was unable to frown, smile, wrinkle the forehead, etc. He also made a good recovery.

¹ Am. Jour. Med. Sci., Apr., 1899.

² Brit. Med. Jour., July 15, 1899.

J. H. Larkin and S. E. Jelliffe¹ report a case of **alcoholic multiple neuritis**, with autopsy. The clinical features were perfectly typical. They found grave variations from the normal structure of the ganglion-cells of the anterior and posterior horns, the columns of Clarke, the nucleus of Stilling, and the nuclei of the medulla. These changes consisted of simple swelling of the ganglion-cell or of its chromatin-particles; fine granular disintegration of the chromatin; central, peripheral, perinuclear, and general chromatolysis; wandering of the nucleus to an eccentric position, and destruction of the achromatic structures, sometimes reaching complete disintegration of the cell. They are inclined to believe that the cellular change is more dependent upon the peripheral degeneration than upon the direct action of the alcoholic poison upon the molecular structure of the cell, and attribute the degeneration of the column of Clarke, with Van Gehuchten, to disturbance of the mutual trophic action which ganglion-cells generally are supposed to exert upon each other.

M. Lapinsky² makes a study of the changes in peripheral nerves due to **chronic disease of the bloodvessels** of the extremities, and concludes: First, that degeneration of the vessels, in the form of chronic endarteritis or arterial sclerosis, may produce a disease in the nerve-trunks. Second, that this disturbance of the nerves may be most marked when the patient is warm in bed, especially at night; and gives rise to much pain. Third, that the motor function of the nerves may not be modified, or, at most, but slightly diminished. Fourth, that other sensory functions may be lessened or not. Fifth, that the skin-reflex and tendon-reflex may be normal or increased. Sixth, that the reaction of the nerves to faradic and galvanic electricity may remain normal, or be somewhat diminished, especially to the galvanic current. Seventh, that the changes in the nerves should be sought in the persistent edema resulting from the arterial disease. Eighth, that the changes of the nerves pertain to the group of dystrophic inflammatory scleroses. The endoneurium and epineurium are especially changed.

F. E. Batten³ makes a study of the pathology of **diphtherial paralysis**. He states that at the present time it is generally recognized that the lesion most commonly found is a parenchymatous degeneration of the myelin-sheath of the nerves, finally affecting the axis-cylinder, according to Martin; but points out that more recent investigations tend to show that the primary lesions occur in the cells of the anterior horn, as demonstrated by Mouravjeff, Crocq, and others. In the author's series of cases, the anterior horn and the posterior root-ganglion appeared normal; but it is possible that the cells in these cases had time to recover, as occurred in a number of experiments by Mouravjeff. He concludes, however, that it is probable that the dominant lesion in diphtheric paralysis is a parenchymatous degeneration of the myelin-sheath of the nerve.

Allard⁴ reports a case of multiple neuritis appearing 15 days after the onset of a badly treated **gonorrhea**. As the gonorrhea yielded, improvement slowly followed under electrical treatment.

Erythromelalgia.—S. Weir Mitchell and W. G. Spiller⁵ report a

¹ Med. Rec., July 8, 1899.

² Deutsch. Zeit. f. Nervenhe., Dec., 1898.

³ Brit. Med. Jour., Nov. 19, 1898.

⁴ Arch. d'Elect. méd., June 15, 1898.

⁵ Am. Jour. Med. Sci., Jan., 1898.

case of erythromelalgia, with microscopic examination of the tissue from an amputated toe. The findings were of an interesting character. The nerves of the great toe, which was amputated, were intensely degenerated; hardly any nerve-fibers could be found in the sections. The vessels also presented degenerative changes. The media was thickened and the intima intensely proliferated. In some of the smallest vessels the lumen was almost obliterated. The bones seemed hypertrophic. The authors are unable to say whether the arteriosclerosis or the neuritis was the primary lesion, but feel confirmed in their belief that erythromelalgia is associated with, if not entirely dependent upon, neuritis. [On the other hand, there is an increasing array of indications, as already noted in previous editions of the YEAR-BOOK, that the disease is frequently primarily in the cord.]

James Collier¹ reports a number of cases of erythromelalgia occurring in patients suffering from organic nervous disorders. As these cases were under the immediate care of Jackson, Bastian, Gowers, Tooth, and Colman, the report is of unusual value. He reports 10 cases in all; 6 in conjunction with multiple sclerosis, 2 with tabes dorsalis, 1 with myelitis, and 1 with so-called traumatic neurasthenia, which probably, as he suggests, was 1 of myelitis. The peculiarity of the erythromelalgia in the cases of tabes was that it occurred in conjunction with gastric crises, and disappeared upon their subsidence. In several of the cases there were spontaneous attacks at first, and afterward the condition was uniformly induced by the dependent posture of the legs, and later a condition of permanent vasomotor palsy of greater or less degree appeared. He believes that this condition will be more frequently noted in conjunction with organic cord- and brain-diseases if the association is kept in mind; and that in many instances it has been mistaken for ordinary vasomotor disturbance, to which the true significance has not been attached.

DISEASES OF THE SPINAL CORD.

Changes in the Eye after Injuries to the Spinal Cord.—Dunbar Roy,² after a consideration of this subject in the literature, reaches the conclusions: 1. That there is no anatomic connection between the eye and the spinal cord, with the exception of the sympathetic system, which itself is reflex. 2. That injury to the spinal cord causes no pathologic changes in the eye, except in the size of the pupil. 3. That spinal injury may affect the vasomotor system, as evidenced in the eye by increased tension from dilatation of the bloodvessels; but even this would be transitory. 4. When gross lesions do occur in both the spine and the eye, it is always the optic nerve that is affected; and even this association must be considered accidental, and nowise in the light of cause and effect. 5. Observation teaches that such symptoms as do appear in the eyes after injury to the spine are purely subjective, and also very transitory.

Local Effect of Cocain on the Spinal Cord.—Bier³ has injected cocain directly into the dural sheath, for the purpose of producing anesthesia for operative purposes. The lumbar puncture is made with the help of Schleich's anesthesia; and 0.5 cc. of a 1% cocain solution was experimentally injected in a subject. A warm sensation was at once experienced

¹ Lancet, Aug. 13, 1898.

² Phila. Med. Jour., Nov. 12, 1898.

³ Deutsch. Zeit. f. Chir., vol. li.

in both legs, anesthesia occurring 7 minutes after the injection, and in a short time its upper level reached as high as the nipple. Analgesia was complete. The sense of touch, however, was not affected. After 45 minutes, susceptibility to pain returned. The knee-jerks remained normal. The author also made the experiment in his own body, with somewhat similar results. The next day, however, there were headache, giddiness, and a small pulse, necessitating the horizontal posture. The method, the author adds, can be recommended for operations on the lower extremities where operation without a general anesthetic is indicated. The chief precaution to be observed is prevention of the escape of cerebrospinal fluid, which alone appears sufficient to cause unpleasant symptoms.

Extradural Spinal Hemorrhage.—S. D. Hopkins¹ reports a case of spinal hemorrhage occurring in a man, of previous good health and history, who denied syphilis and alcoholism. While shovelling coal he experienced a peculiar sensation throughout the body, and after loading a wagon crawled aboard and drove to the scales, at which point he had to be assisted to the ground, complaining of sharp, excruciating pains in the lower portion of the back, extending around to the abdomen and down the thighs. Motor power of the legs was entirely lost, as was also sensation in the trunk and legs. During the next 3 days sensation gradually returned, and the patient had incontinence of urine. On the third day the motor power of the left leg was good in every direction, but he was unable to make the slightest movement with the right. Sensation was present throughout the body. The right knee-jerk was absent; the left increased. Plantar reflex slight on the right side; absent on the left side. The patient complained of girdle-sensation, and had incontinence of urine and feces. On the following day nausea occurred; and during the evening he made a sudden movement, suffered a severe pain in the back, and in a few moments had a general convulsion, in which he died. Nothing abnormal was found postmortem excepting, external to the dura, considerable liquid blood and a few small clots, the latter in the lumbar region. The membranes were slightly congested, but the cord seemed normal. [It is much to be regretted that this case did not have a more thorough examination and more careful report, as meningeal hemorrhage of the cord, though extremely rare, presents a condition amenable to surgical measures.]

Roux and Pairot² report the case of a woman of 41, suffering from paresis of the lower extremities and other spinal symptoms, including difficulty of locomotion, staggering gait, lost reflexes, and disturbed tactile sense, finally becoming developed into analgesia and the paraplegic condition. Finally the sphincters were involved, the arms were paralyzed, delirium ensued with hallucinations of sight and bulbar invasion, and there was a fatal termination. Upon section the dura mater of the spinal cord was found covered with a number of little, glistening bodies. Upon microscopic examination microorganisms were found in the pial septums of the cord, varying in length from those of a tubercle-bacillus to long filaments formed of chains of individuals of uniform caliber placed end to end, with a space between. These were also found in the substance of the spinal cord, in its lumbar portion, and were abundant in the neighborhood of vessels. Nowhere was there any evidence of inflammatory action, and the authors conclude that the parasite was a fungus belonging

¹ N. Y. Med. Jour., Aug. 26, 1899.

² Presse méd., Feb. 23, 1899.

to the group of streptothricaceas, but no cultures were made. This is the first case of *mycotic infection* of the nerve-centers on record.

Acute Ascending Myelitis.—Roger and Josué¹ report a case in which the clinical course of the disease was typical. Bacteriologic examination proved that the disease resulted from the presence of the **pneumococcus**, and furnishes the first instance in which this microbe has been demonstrated as the pathogenic agent in this disease. The spinal cord showed lesions of variable intensity involving the cells of the anterior horns. There was an absence of hyperemia, but proliferation of neuroglia-cells. The posterior roots appeared normal. The lesions were most pronounced in the lumbar enlargement, but were also found high up in the cervical cord.

N. Jagie² reports a case of acute ascending spinal paralysis that, with a very few others in the literature, makes up a class of cases in which the symptom-group of Landry's palsy is shown to be **dependent upon a poliomyelitis** identical with that so common in children, but occurring in adults. Jagie's case was a man of 26, in good health, who on September 17 was taken ill with fever and gastric disturbance. He kept at his work during the first day; on the second day he felt that his lower extremities were weak; and 3 days later, or on the fifth day of the disease, had spasms in the lower extremities, and the right arm also became parietic. September 26 all 4 extremities were involved, and the voice was weak. Sensation was not particularly modified; the knee-jerks were lost, and the abdominal, cremaster, and foot-sole reflexes also were lacking. A diagnosis of acute ascending spinal paralysis was made. The bowels were obstipated; the catheter had to be used; and death occurred October 2. The anatomic diagnosis was acute poliomyelitis and left lobar pneumonia. The gray matter the entire length of the cord appeared red and swollen, and with various stains showed an acute inflammatory appearance, with frequent hemorrhages. The author is inclined to divide cases of Landry's paralysis into 3 groups: 1. Cases in which the spinal cord presents no anatomic change; such have been reported by Westphal, Curschmann, Cornil, Thomayer, Pal, and others. 2. Cases in which myelitic and poliomyelitic foci are recognized; as reported by Baungarten, Hoffmann, Curschmann, Immermann, Eisenlohr, and others. 3. Cases in which polyneuritis was found; as reported by Dejerine, Nauwerk and Barth, Eisenlohr, and others.

Poliomyelitis.—F. A. Packard³ reports anterior poliomyelitis occurring simultaneously in a brother and sister; and in connection with the report makes a very complete reference to similar instances in the literature and the cases of **endemic variety**.

Matthes⁴ reports an autopsy upon a recent case of acute poliomyelitis, death occurring from pneumonia on the fourth day after the appearance of the disease. In the anterior horns of the entire cervical cord, and in the left anterior horn of the dorsal cord, inflammatory foci were found. The change was an **acute myelitic process**. The bloodvessels were filled with blood, and the perivascular spaces presented small-cell infiltration. At some points hemorrhage had taken place.

¹ Presse méd., July 27, 1898.

³ Jour. Nerv. and Ment. Dis., Apr., 1899.

² Wien. med. Woch., Feb., 1899.

⁴ Deutsch. Zeit. f. Nervenhe., 1898.

Syphilis of the Spinal Cord.—R. T. Williamson¹ reports on a case of **Erb's type** of spinal syphilis, in which he summarizes the pathologic changes as follows: Endarteritis and hyaline degeneration of the arteries of the spinal cord and meninges; slight meningitis; gummatous infiltration of the right anterolateral columns in the upper dorsal region; sclerosis of the periphery of the cord in the lateral columns in the whole of the dorsal region; sclerosis in the posterior median columns in the upper dorsal region; irregular sclerotic patches, with 1 patch of cell-infiltration (gummatous) in the lowest dorsal region; descending sclerosis in the lumbar crossed pyramidal tracts; ascending sclerosis in the cervical posterior median columns. [The case would seem to present, therefore, the type of spinal involvement that Gowers describes as ataxic paraplegia, ascending and descending degeneration secondary to local myelitis. There appears to be no good and sufficient reason for considering this form of spinal disease as worthy of separate description. Interest strongly attaches to the endarterial changes, which in this case were the primal lesions.]

Syringomyelia.—Bullard and Thomas² report a case of syringomyelia with *unusual symptoms*. A boy, previously healthy and of good antecedents, at 3 years of age was subject to attacks of severe headache, lasting an hour or more. These were later accompanied by vomiting, and increased in frequency and severity. After 3 years, staggering was noticed and double optic neuritis appeared, resulting in double optic atrophy and nearly total blindness. The vomiting, headaches, and blindness continued for another 2 years, until death. At times he was confined to bed; and at other times was up and about like a healthy child. At one time he was very fat; and later presented, in addition, exophthalmos and a suggestion of myxedema, which 2 latter conditions disappeared after a few months. At one time there were temporary paresis of the eye-muscles—external recti—and nystagmus, which later disappeared. Ten months after the blindness began there was a sudden attack of paraplegia, which remained permanent; and the lower extremities were drawn up. Incontinence of urine and feces appeared at the same time, and were permanent. There were also at the same time paralysis of the left side of the face and weakness of the upper extremities; but these disappeared. Bedsores appeared, and the child died from an intercurrent attack of typhoid fever. Anatomically, marked dilation of the ventricles and a branched cavity in the cord, apparently originating in the gray matter, and not as a diverticulum of the central canal, were found. Above the greatest dilation of the spinal-cord cavity there was ascending degeneration of the cerebellar tract, the tract of Gowers, and the posterior column. Below this, degeneration of the direct and crossed pyramidal tracts, and diffuse atrophy of the posterior columns, apparently related to the cavities in the posterior horns. At the point of greatest dilation; namely, about the sixth dorsal segment, there was extensive degeneration of all fibers of the white matter of the cord and destruction of the gray matter, in which, however, fairly normal nerve-cells were found in moderate numbers. A diffuse increase of neuroglia-fibers was noted in the atrophied tracts, and proliferation of the neuroglia about the cavity of the cord. The authors suggest the advisability of expecting syringomyelia

¹ Brit. Med. Jour., Dec. 31, 1898.

² Am. Jour. Med. Sci., Mar., 1899.

when hydrocephalus is observed; but they distinctly emphasize the fact that the cord-cavities in this case were not due to pressure from the central canal, outside of which they seemed to have originated.

Orlowski¹ reports a case of syringomyelia showing **both phenomena of cavity-formation side by side**; in one arising from the central canal, in the other, from a gliosis outside of the central canal. The author considers the relation between the two to be explained on the hypothesis that the cavity-formation in syringomyelia results from venous and lymphatic stasis. The sarcomatous growth causes a stasis; and this in turn gives rise to gliosis, and eventually to syringomyelia.

Tumor of the Spinal Cord.—Hudson, Barker, and Flexner² report a case of glioma of the lower cervical region producing an alleged total transverse lesion, in which spasticity of the lower limbs was present and the deep reflexes persisted; but in the body of the article it is stated that the tumor involved nearly the whole cord, a mere rim of nerve-fibers surrounding it, and this showed degeneration posteriorly and anteriorly; therefore, it seems that no valid objection is presented to the general rule, that total resection of the cord abolishes reflexes below the lesion, in man.

J. C. Warren³ reports a case, with operation done June 9, 1898, in which he found a tumor, fibromatous in character, about as large as an olive, in the lower dorsal region, situated at the level of the ninth dorsal vertebra. The tumor was easily removed, as the adhesions were slight, and practically no hemorrhage took place. After the operation there was no return of sensibility for a time, and then only to a very slight degree. Motion was at first entirely absent; but began to return in 3 days, increasing very slightly. The patient was subsequently able to walk alone, though with difficulty; and the sensibility became nearly perfect. Reflex spasms, especially of the muscles of the feet, are still troublesome; and the knee-jerks are as before the operation, which was preceded by the ordinary hemiplegic state and a tendency to the Brown-Séquard symptom-group.

J. J. Putnam and J. C. Warren⁴ report the preceding case of tumor of the spinal cord, in which operation resulted in brilliant success, and 2 other operations for spinal conditions of a somewhat similar character, followed by gratifying improvement. The authors tabulate 33 cases of operated spinal tumors, with results which, on the whole, are favorable to surgical intervention in these cases, which otherwise are without any possible relief.

L. Bruns⁵ reports 20 cases from the literature, in which operation was done; and in all the diagnosis was proved correct. In 18 the tumor was found at the operation; in 6 cure or great improvement followed; in 2 there was slight or temporary improvement; in 12 the patient died soon after the operation from shock, hemorrhage, or sepsis. He thinks operation is always obligatory in these cases, owing to their hopeless character, and considers these results satisfactory under the circumstances.

Eichhorst⁶ reports a case in which a mass of lymphoid tissue was found in the peridural fat on a level with the fifth or seventh dorsal vertebrae, presenting on the posterior surface of the cord, which was softened

¹ Arch. de Neurol., Sept., 1898.

³ Boston M. and S. Jour., May, 1899.

⁵ Die Geschwülste des Nervensystems.

² Am. Jour. Med. Sci., June, 1899.

⁴ Am. Jour. Med. Sci., Oct., 1899.

⁶ Deutsch. Arch. f. klin. Med., Band 61.

at that point. During life there had been symptoms of compression of the spinal cord. The case was one of general glandular leukemia.

J. T. Eskridge and L. Freeman¹ report a case of intradural spinal tumor opposite the body of the fourth dorsal vertebra, with complete paralysis of the parts below the lesion. Operation was followed by recovery, and ability, within 3 months, to walk without assistance. [The case is one of unusual interest from the clearness of the diagnosis before operation and the successful result of surgical intervention. Improvement appeared within 4 hours after the operation: first a return of subjective sensation, then objective sensation was recovered, and finally motion in the paralyzed parts. The tumor was a soft fibroma; and the case was very similar to that of Warren, noted above.]

Multiple Sclerosis.—Schuster and Bielschowsky² made a careful anatomic study of the lesions in this disease, and insist that the changes are mainly in the interstitial tissue, secondarily encroaching upon the parenchyma. They do not accept the hypothesis of Popoff and others, who attribute the avenue of infection, or whatever may be the inciting cause of the disease, to the arterial stream; and they attempt to harmonize the clinical manifestations of the disease with their findings of its interstitial beginning.

S. H. Friend³ reports a case of multiple sclerosis, of typical clinical history, with a very full histologic report. He believes that the pathology in this case indicates a causative factor primarily acting upon the cells of the bloodvessels. The lumens of the vessels presented a varying thickness in different areas. Obliteration was caused directly by contraction, or indirectly by thrombosis. Changes of the cells throughout the cord indicated that they were starved, and that the degenerative process was a slow atrophy. The ganglion-cells were smaller than normal; their outlines thickened and jagged. He concludes that the degeneration of the bloodvessels in this particular case caused the degeneration in the tissues of the cord; and that the syphilitic affection hastened the atrophy of the bloodvessels.

T. Buzzard⁴ discusses the differential diagnosis of **insular sclerosis and hysteria**, and lays stress upon a number of points. He says that in at least 50% of cases of insular sclerosis is found some—often very slight—atrophy of one or both disks, furnishing decisive proof that the patient is affected with organic disease. In hysteric paraplegia he points out that there is often profound anesthesia of the lower extremities, which is no part of the picture of insular sclerosis. He refers to his former contention, that in hysteria the plantar reflex is usually absent whether the parts are anesthetic or not; while this is not true of multiple sclerosis. Babinski's toe-sign he has also found in cases of insular sclerosis in which he has sought for it.

Change in the Spinal Cord in Anemia.—J. S. Risien Russell⁵ makes a very valuable contribution to the subject of spinal-cord changes in anemia, and suggests, with a good deal of plausibility, that the spinal cord takes on the changes and presents the symptom-group that Gowers has described under the title of ataxic paraplegia. He reports 3 cases,

¹ Phila. Med. Jour., Dec. 10, 1898.

² Zeit. f. klin. Med., 1898.

³ Phila. Med. Jour., Jan. 21, 1899.

⁴ Brit. Med. Jour., May 6, 1899.

⁵ Lancet, July 2, 1898.

with postmortem investigation of the cord. While admitting that there is a close association between the changes in the spinal cord and profound anemia, it seems to him quite certain that the cord-changes cannot be directly attributed to the anemia from an etiologic point of view; and he believes that both are attributable to some toxic condition, placing himself, therefore, in accord with Nonne, Minnich, Arloing, Teichmüller, Juliusberger, and others.

Combined Sclerosis of the Cord.—C. L. Dana¹ considers ataxic paralysis associated with lethal anemia and toxemia, and concludes that there is a class of cases of spinal-cord disease characterized by symptoms of numbness, ataxia, and paralysis involving the legs and then the arms, progressing at first slowly and then rapidly, and ending in 1 or 2 years. To this he would give the name of subacute spinal paralysis. The disease is due to some variety of toxemia. It may be, and usually is, associated with pernicious anemia or profound secondary anemia. It may be seen after malarial and lead-intoxication. It occurs usually in middle life, and more frequently in women than in men. It resembles light grades of multiple neuritis, and sometimes the earlier stages of locomotor ataxia. It is recognizable by the presence of anemia, the cachexia, the age of the patient, the progressive and rather rapid course, the absence of pain and tenderness over the nerves, and the absence of the eye-symptoms and girdle-symptoms of locomotor ataxia. Its anatomy consists in a progressive degeneration involving most of the posterior columns, to a less extent the lateral columns, and later the gray matter, and still later parts of the white matter. The treatment of the disease is always ineffective in the later stages. In the earlier stage the disease may be modified by the use of arsenic, quinin, tonics, proper feeding, and saline injections. [While it is true that the tendon-reflexes are generally reduced, they may be greatly exalted, and ankle-clonus may be present.]

M. Nonne² makes a further contribution to this subject, and, after reviewing it from all points of view, he draws practically the following conclusions: 1. Changes in the spinal cord subsequent to the fatal anemias are not systemic in the sense of the combined-system diseases, but are more like acute disseminated myelitis. 2. Localization of this myelitis is associated with the bloodvessels. 3. It is very probable that there is an etiologic relation between the noxious influence and the blood-current. 4. The gray substance may be primarily affected. 5. By means of the Marchi method, in the severe anemias and in fatal cases of sepsis, diffuse degenerations may be observed in the spinal cord in the neighborhood of the foci of myelitis; and in this respect the posterior roots and the anterior commissure seem to be sites of predilection.

Tabes.—R. B. Ness³ reports a case of locomotor ataxia in a woman, terminating fatally by **oral ulcer**. The case presented, according to the author, the following interesting points: It occurred in a female, and presented at first exaggerated plantar reflexes and occasional involuntary spasmodic movements of the legs. At one time there were a fine tremor of the hands and a slight nystagmus. The postmortem findings were those ordinarily encountered. Interstitial nephritis accounted for the albuminuria, and perhaps for a retinal hemorrhage which had been

¹ Med. Rec., June 24, 1899.

² Zeit. f. Nervenhe., 1899.

³ Edinb. Med. Jour., June, 1899.

observed. Death resulted from cancrum oris, with extension of the gangrenous process to the base of the skull and the brain, which condition he considers analogous to the acute bedsores of acute myelitis.

P. K. Pel¹ reports another peculiar symptom, as, he thinks, recorded for the first time, in relation to this disease. His patient presented well-marked evidence of posterior sclerosis, and at times a peculiar **crisis attended by high fever**. Five of these were observed, and 1 is described as follows: "After a good night's rest, the patient, about 11 o'clock in the morning, experienced an unpleasant feeling of chilliness, which was followed by a distinct chill and some prostration. Shortly, severe pains occurred in the lower extremities, first in the feet and then in the legs, with painful twitching of the members, which sometimes raised them from the bed. Later, there were similar pains and twitching in the upper extremities, commencing in the hands. Toward evening the painful paroxysms became intensified, and were followed by vomiting of a watery fluid, and the eyes were involved. There were intense photophobia, pains, increased lacerimation, and congestion of the head. Both eyes were very red and inflamed. The eye-pain was worst in the neighborhood of the lower lid. The next morning the eye-symptoms had receded, the pains were less, and the patient felt merely weak and miserable. The pains subsided entirely on the second day. During the attack the temperature gradually increased, until at 4 o'clock in the afternoon it was about 104° F., with a pulse of 150. The next day there was a classical herpes labialis on the under lip; and this appeared in all the attacks." Pel convinced himself by careful investigation that there was no other explanation of these attacks than the tabetic state.

Joseph Fränkel² makes a very important contribution to the subject of **sensorimotor palsies of the face and eyes** in tabes. He carefully investigated 22 cases, which are fully tabulated, and finds: 1. Disease of the fifth nerve interferes with mobility of the face. 2. No function of the trigeminal in particular can be ascertained which could be justly supposed to be the cause of the impaired motility, but the kinesthetic sensibility was found more frequently and more extensively disordered than its other functions. 3. The effect of disease of the fifth nerve upon mobility of the eyes seems to be of similar character. 4. Some of the ocular palsies of tabes are probably sensorimotor.

W. B. Pritchard,³ in an article on the early diagnosis of locomotor ataxia, among other well-recognized **early symptoms**, calls attention to the headache and insomnia, first fully noted by Dana, which are early features of many of these cases. Ready fatigue is also an early symptom, due, probably, to the muscular hypotonus. The well-known ocular symptoms, especially inequality of the pupils, sluggishness of accommodation for light, and the full Argyll-Robinson pupil, of course, are mentioned, with the loss of the knee-jerk, the early lightning-pains, disturbance in the genitourinary functions, especially of the control of the bladder, and the various crises which so commonly are misapprehended by the general practitioner.

Trümmer⁴ reports 2 cases in Jolly's clinic, from which he conceives that tabes is **attributable to traumatism**. His first case is open to

¹ Berlin. med. Woch., June 26, 1899.

³ N. Y. Med. Jour., July 22, 1899.

² Jour. Nerv. and Ment. Dis., Oct., 1899.

⁴ Berlin. klin. Woch., Feb. 13, 1899.

doubt, as the patient's wife also presented evidence of chronic processes in the brain and cord. The second case also presented penile scars, though there was no history of syphilis. The cases, therefore, fail to meet crucial requirements.

Martin Bloch¹ reports a case of *tabes dorsalis* with **bulbar paralysis**. He refers to 2 cases previously reported in the literature by Howard and Charcot. With the case reported by the author, these 3 present well-marked instances of what is usually recognized as bulbar palsy, the symptom-complex of glossolabiopharyngeal paralysis. [This association is much more common than reported cases would indicate.]

P. Bounnier² furnishes a very suggestive article on the **labyrinthine disturbance** found in *tabes*. After referring briefly to the literature of the subject, he calls attention to the fact that disturbance of the labyrinth may produce a large number of symptoms that are not usually attributed to modifications of the aural apparatus. He names deafness, vertigo, labyrinthine oppression, the Romberg sign, difficulty of walking in the dark, agoraphobia, claustrophobia, numerous forms of bulbar and central irritation, horizontal and vertical nystagmus, incoordinate movements of the ocular globe, ptosis, strabismus and diplopia, inequality and retardation of accommodation to light, unilateral or bilateral mydriasis and myosis, amblyopia, paralysis of accommodation for distance, and the most diverse disturbances of oculomotricity. In addition he mentions pure auditory disturbances, such as unilateral retardation of audition, diplacusia, echo-acusia, etc. He finds some disturbance of the labyrinth in 80 % of cases of *tabes*; and urges that when such labyrinthine disturbances are found, without other evidence of spinal or cerebral involvement, the possibility of incipient *tabes* should be borne in mind. He would not invariably attribute the symptoms enumerated to labyrinthine involvement; but insists that disturbance of the labyrinth may cause any or all of them, either with or without coincident *tabes*; and that in some cases of *tabes* there is unquestioned anatomic change in the labyrinth. [There is no doubt that the auditory and cranial nerve-disturbances, especially those of the fifth, in *tabes* have not been sufficiently studied.]

A. J. Whiting³ contributes an article on **paralysis and muscular atrophy in *tabes***, with a table of cases presenting this combination, and a lengthy bibliography of the subject. It is apparent that both palsy and atrophy are far from uncommon in *tabes*.

Gilles de la Tourette⁴ calls attention to a **peculiar, but expressionless, brilliant appearance of the eye** which he has noticed in some cases of *tabes*.

Fränkel⁵ adds importance to the **lack of muscular tone** in *tabes*, and believes that it is a constant and initial symptom of this disease, making its appearance, with very few exceptions, in the preataxic period, and serving to distinguish *tabes* from the first. He has found it but twice apart from locomotor ataxia. [For further information regarding this sign, see the YEAR-BOOK for 1898.]

C. C. Douglas⁶ reports upon investigations as to the **contents of the stomach** in the course of *tabes*, and concludes that during the crises

¹ Neurol. Centralbl., Apr., 1899.

³ Brain, Winter, 1898.

⁵ Presse méd., July 20, 1898.

² Nouv. Icon. de la Salpêtr., 1899.

⁴ Jour. des Prat., Mar. 11, 1899.

⁶ Lancet, Apr. 15, 1899.

the stomach secretes a large quantity of digestive fluid inferior in but slight degree to that of health; but there is no indication that this secretion is associated with hyperacidity or hyperchlorhydria; and that apart from the occasional presence of blood there is nothing indicative of a true lesion of the stomach.

A. Wiener¹ reports 3 cases of tabes in which the **exercise-treatment** devised by Fränkel gave excellent results.

Friedreich's Hereditary Ataxia.—G. G. Rennie² reports a typical case of this nature, with the postmortem findings, which correspond very closely to those elsewhere reported. He notes well-marked degeneration of the posterior columns throughout their entire length, of the posterior root-zones, and of a large number of posterior root-fibers. There was less well-marked degeneration in the lateral columns in the region of the crossed pyramidal tracts, and scattered marginal degenerations at different levels, with distinct degeneration of the cerebellar tract and atrophy of Clarke's column.

Progressive Muscular Atrophy.—P. Sainton³ reports a case of the neurotic type, more familiarly known as the type of Charcot-Marie, or the Charcot-Marie Tooth type, which, upon careful autopsic finding, presented marked changes in the spinal cord. The author closes his study of the case as follows: "Regarding the lesions, we find: 1. Alterations of the cord, consisting in (a) sclerosis of the posterior columns, predominating in the column of Burdach; (b) slight degeneration of the pyramidal tracts on both sides; (c) alterations in Clarke's column; (d) cellular changes in the anterior horns, consisting in atrophy. 2. Alterations of the peripheral nerves: (a) Slight degeneration of the intramuscular nerve-fibers; (b) lesions of the nerve-trunks in the forearm and leg—a slight sclerosis; (c) the greater nerve-trunks, such as the sciatic, are normal. 3. The muscular lesions consist in atrophy of the muscle-fibers, varying in the different muscles, sometimes reaching a complete disappearance of sarcode-elements and substitution by fibrous tissue."

Fr. Schultze⁴ gives the history of a case of **progressive pseudo-hypertrophy of the muscles, with atrophy of the bones**. He refers to cases reported by Frederick and Le Johns, in which there was evident atrophy in connection with the muscular dystrophy. This was clearly exhibited in a patient shown by the author; and a point of peculiar interest is that the patient's sister presented multiple arthropathies, with atrophy of the bones. Cross-sections of the bones, in the case of the first patient, showed that there was lack of spongy tissue, the medullary canal being very small, and the denser structures being comparatively thick; but the cross-section of the bone was diminutive as a whole.

NEUROSES DEPENDENT UPON INFECTION.

Chorea.—R. B. Preble⁵ says, in regard to the relation of chorea and rheumatism, that there is no evidence for the idea that chorea is a specific infectious disease due to a definite, though unknown, organism, and draws the following conclusions: 1. There is certainly some **relation between**

¹ Med. Rec., July 22, 1899.

² Brit. Med. Jour., July 15, 1899.

³ Nouv. Icon. de la Salpêtr., June, 1899.

⁴ Deutsch. Zeit. f. Nervenhe., Apr., 1899.

⁵ Jour. Am. Med. Assoc., Mar. 11, 1899.

chorea and rheumatism. 2. Rheumatism is much more frequent in children suffering from chorea than in children in general. 3. Rheumatism excites chorea by the selective action of toxins upon the motor cells of the cortex causing functional, but not structural, changes. 4. Rheumatism shares this relation to chorea with a great number of other infectious diseases. F. Schultze¹ discusses the **relation of the myoclonias to chorea**, and would group the choreas and the myoclonias together under some generic title, and bring the electric chorea of Henoch into the same category. H. Reinhold² reports a case of chorea terminating fatally. Anatomically, he found **sinus-thrombosis** in the brain, and believes that the irritation of the cortex, manifesting itself in choreic movements, was secondary to this sinus-disturbance.

Westphal, Wassermann, and Malkoff³ have succeeded in isolating from the blood, brain, and endocardiac vegetations, in a case of rheumatism with chorea, a **micrococcus**, cultures of which produced poly-arthritis in lower animals. Intravascular injection of this micrococcus was followed by high fever and multiple joint-disturbance, usually of fatal termination. The joints presented edema, and the micrococcus was found in the exudate. Subsequent culture again produced multiple arthritis. The microorganism is a streptococcus, but may appear in the blood as a diplococcus. The authors note that for its culture excess of alkalinity and a large amount of peptone are required.

Dakin,⁴ regarding the **chorea of pregnancy**, draws the following conclusions, based upon 7 cases: Chorea is more common in the first than in subsequent pregnancies. Its occurrence is not influenced by legitimacy or illegitimacy. In most instances there is a history of a former chorea or of acute rheumatism. The majority of cases occur in women under 25. The disease usually begins during the first 6 months; and the earlier the onset the more severe the symptoms. In each case cardiac bruits or post-mortem endocarditis were present. In none of the cases was there an attempt at spontaneous abortion. Mania occurred at some time in 6 out of 7 cases; in 2 of them only after delivery. In every case the mania subsided very quickly after delivery; but the choreic movements persisted, and in only 1 case was there marked improvement. Chloroform is beneficial in quieting the spasms and procuring sleep, and should be used during operative manipulations. Hyoscine is also useful. Of the 7 cases, 2 were fatal, each fatal case having a temperature exceeding 106° F. The prognosis depends upon the severity of the spasms during the first week of the onset; if they remain mild for a week, the case is likely to prove amenable to treatment.

James W. Russell⁵ presents a paper in which he makes a study of the **handwriting in chorea**. He would divide cases of chorea into several groups in relation to their ability to write. The **first** group contains those cases in which the interference with voluntary writing corresponds with and directly proceeds from the choreic movements, and the difficulty is proportional to the amount of choreic disturbance. In the **second** group are

¹ Deutsch. Zeit. f. Nervenhe., Dec., 1898.

³ Berlin. klin. Woch., No. 29, 1899.

² Ibid.

⁴ Practitioner, Dec., 1898.

⁵ Lancet, Apr. 1, 1899.

cases in which a more or less complete control over the movements can be exercised, even if they are of considerable severity. In the **third** group he would place cases in which, although there apparently is no chorea, or but the slightest of the right side, yet the act of writing is greatly interfered with. In the **fourth** group are cases which resemble the second group in the complete control which can be exercised over the movements, but present a marked defect of writing. Thus, on taking the pen the hand becomes perfectly steady; nevertheless, writing is entirely unintelligible, there being an apparent inability to guide the delicate movements of the fingers, although, in addition, there may be some mental impairment. In the **fifth** group he places 2 cases which he had observed, presenting either complete or almost complete inability to write, although the choreic movements were of very moderate severity. He thinks this was due to intellectual defect, a sort of agraphia; and the speech sometimes is correspondingly impaired, in 1 instance the patient being only able to answer "yes" or "no." In the second case the speech was reduced to a jargon. He gives samples of the handwriting.

Luigi¹ records considerable success in the management of chorea by means of **oil of gaultheria** externally. He employs 6 to 10 gm. of the oil, pure or mixed with vaselin, as a dressing for the upper and lower limbs alternately, covering the parts with oiled silk to prevent evaporation. Phenol appeared in the urine 6 hours after the application in some cases. He also gives the drug internally. The good results were not confined to cases that were definitely rheumatic, but in such cases the drug acted very satisfactorily.

Tetanus.—G. J. Rambaud² reports from literature a collection of 9 cases of tetanus treated by **intracerebral injections of antitoxin**, and 3 cases in his own practice. In the same issue, Charles A. Church reports a case similarly treated. From the reports of cases in literature, Rambaud states that in all fatal instances the course of the disease was extremely rapid. But out of the 9 cases quoted, 5 died; and in the 4 cases that recovered, in which the period of incubation is stated, in only 1 was this period less than 9 days; namely, the first, in which only 4 days elapsed before the appearance of tetanus. [Taking the other 6 cases, all that are mentioned, and many of them incompletely reported, we have a total of 15 cases, with but 4 recoveries; and these recoveries are precisely in the cases which ordinarily give the best prognosis. While, therefore, theoretically the process has much to commend it, it must be considered as decidedly on trial.] D. Semple³ reports a case of tetanus treated by intracerebral injections of antitoxin. On Nov. 14 a soldier received a scrotal bruise on the saddle, and 2 days later developed tetanus. Into each frontal lobe of the brain 2.5 cc. of double strength antitetanic serum were injected. At the same time 20 cc. were given hypodermically in the flank. Two days later, during which time he had shown progressive improvement, 20 cc. of antitetanic serum were given hypodermically, and repeated on the next day. Nov. 30 he was convalescent, but weak and anemic, and with a slight tendency to spasm in the arms on exertion. No brain-symptoms were presented; the temperature was normal throughout; and the pulse and respiration regular.

¹ *Riforma Med.*, Nov. 28, 1898.

² *N. Y. Med. Jour.*, Dec. 17, 1898.

³ *Brit. Med. Jour.*, Jan. 7, 1899.

Ombredanne¹ reports the case of a boy, 11 years old, who fell, hurting his knee, and tetanus developed; but the period of time between the accident and the development of the disease is not stated. No effect was obtained from 40 cc. of antitetanus-serum. The author then, after consultation with Roux, made a solution of 6 cc. prepared from dried serum, half of this being injected into each side of the brain, in the frontal region. An erythematous rash appeared on the trunk 24 hours afterward, but rapidly disappeared. The patient gradually improved, leaving his bed 10 days after the operation, and the hospital on the twenty-sixth day, quite well. The serum used in the intracerebral injection was double the usual strength. Heckel and Reznec² used the same treatment, without success, in a case of tetanus appearing 5 days after a scratch by rusty nails.

A case of tetanus treated by intracerebral injection by William F. Gibb,³ first reported April 15, 1899, unfortunately, after the disappearance of all symptoms of tetanus, died more than 8 weeks after the last intracerebral injection. Upon postmortem examination there was no doubt that the fatal termination of the case was due to the particular method employed. The frontal lobes on both sides showed distinct bulging, with flattening of the convolutions and partial obliteration of the sulci. Abscess-cavities were revealed on each side, situated deeply in the center of each lobe. That on the left contained about 2 oz. of thick yellow pus, and was in communication with the left lateral ventricle, into which the pus had passed.

Julliard⁴ reports the case of a man who was wounded with a shotgun. On the seventh day opisthotonos and retention of urine appeared; and 18 hours afterward the patient was trephined, and an intradural injection of 20 cc. of antitetanus-serum was made in the left frontal lobe, followed by a second one of a similar size 20 minutes later. The patient died in 16 hours. Postmortem, no lesions were found at the site of the injections, and the fluid had been entirely absorbed. The patient presented miliary tuberculosis of the lungs; and the author is inclined to think that this may have had something to do with the failure of the treatment. [The symptoms appearing on the seventh day would be favorable for treatment by ordinary remedies, and the fatal termination in this case may perhaps be attributed to the cerebral injections.]

Blumenthal and Jacob⁵ state that the subcutaneous and intravenous injection of tetanus-antitoxin has thus far been unsatisfactory. They therefore, independently of Roux and Borell, turned their attention to introducing it by dural infusion. Goats were injected with lethal doses of tetanus-toxin; and upon the appearance of the first symptoms antitoxin was injected into the subarachnoid spaces, the goats receiving 1000 to 2500 times the amount necessary to neutralize the poison in the test-tube. The results were negative. Antitoxin was demonstrated in the subarachnoid tissue some hours after death. In a control-animal the cerebrospinal fluid contained a little tetanus-toxin. They then trephined a goat, and a few days later injected tetanus-toxin into the thigh. At the first symptom of tetanus, 2000 times the dose of antitoxin was injected

¹ Presse méd., 1898.

² Ibid., No. 74, 1898.

³ Brit. Med. Jour., July 1, 1899.

⁴ Rev. méd. de la Suisse Rom., Apr. 20, 1899.

⁵ Berlin. klin. Woch., Dec. 5, 1898.

into the brain. The animal died 16 hours later. The authors, therefore, are skeptical regarding the advantages of the intracerebral method; and note that 7 out of 8 cases so treated have died, the eighth case being an example of the more chronic form.

Von Leyden¹ reported to the Charité Medical Society a case of puerperal tetanus which was treated with subdural injections. The woman had fallen down stairs in the third month of pregnancy, and aborted the next day. Tetanus appeared 10 days later, and upon admission to the hospital she had morphin subcutaneously and chloral by the mouth for the first 24 hours, in spite of which the symptoms increased and an unfavorable prognosis was entertained. She was given subcutaneous injections of Tizzoni's serum, and on the eighth day of the disease 2 subdural injections of 0.75 gm. of Behring's serum, followed on the tenth day by a subcutaneous injection of 2 gm. of the same serum. Slight improvement followed the first subdural injection, and the patient made a gradual recovery. Altogether, the woman received 9 gm. of antitoxin, 4 gm. of Behring's serum, and 5 gm. of Tizzoni's, which is nearly twice the supposed curative dose, and half of this in the dural sac.

James Berry² reports a case of tetanus which, in spite of the serum-treatment, was unmodified. The serum-treatment was begun within 10 hours of the onset of the first symptoms of the disease, which had an incubation of 6 days, and from that fact may be considered grave from the first. The duration of the disease, as marked by symptoms, was only 27 hours. [From these and other cases, it does not seem established that the intradural method of serum-treatment is either without danger or of signal efficacy, though theoretically attractive. The general fact remains, that cases of short incubatory periods—namely, under 6 days—almost invariably perish; and that those of 10 or more days may get well under any treatment, and perhaps in spite of all treatment.]

Tetany.—Elizabeth R. Bundy³ reports a case of tetany, and refers to the classification made by Fränkel-Hochwarth. Group I. includes the tetany of otherwise healthy adults, the "idiopathic tetany of working-men;" "acute or relapsing acute, occurring at certain seasons, and often in certain localities, constituting epidemics at times." In Group II., tetany is associated with gastrointestinal diseases, as helminthiasis; first in importance being gastrectasia, next diarrheal diseases. Group III. includes tetany associated with infectious diseases. In Group IV. tetany has been observed after poisoning, and this includes, appropriately, cases of nephritis. Group V. includes cases occurring during pregnancy, labor, and lactation. Group VI. includes cases following removal of the thyroid gland; also cases associated with atrophy or absence of the gland. Group VII. includes cases associated with other severe nervous affections.

Hydrophobia.—B. O. Kinnear⁴ takes the ground that hydrophobia is an easily curable disease. His treatment is to induce perspiration by means of hot air, by the hot Turkish bath, or in any way by which the temperature can be raised. This will, in his estimation, quickly subdue the disease, the poison being eliminated by the skin. This is, in other words, the Buisson system, which claims to have made a number of cures

¹ Berlin. klin. Woch., No. 29, 1899.

³ Phila. Med. Jour., Mar. 4, 1899.

² Lancet, Apr. 29, 1899.

⁴ Med. Rec., July 22, 1899.

in Paris. [The reported cases lack bacteriologic and experimental confirmation of being true rabies.]

Memmo¹ shows beyond doubt the relation of **the microbe** described by Spinelli and Rivolta to hydrophobia. They succeeded in cultivating it in artificial media, and by inoculations with the fourth and later generations induced the disease in dogs and other animals. He found the bacillus in the cerebrospinal fluid, in the substance of the brain and spinal cord, in the saliva and parotid gland, and in the aqueous humor of 4 dogs dying of the disease, and in dogs, rabbits, and guineapigs in which it had been produced by inoculation. Fluid media, especially broth and glucose acidulated with tartaric acid, were found the best for the purpose of cultivation, the germs being isolated through repeated plate-cultures. The growth was inhibited by the admission of extraneous germs from the air or by the dust of the laboratory, and usually did not appear under a week.

Tchernischeff² reports upon the **pathologic anatomy** of rabies in man, based upon a fatal case. In the dorsal and lumbar regions of the cord there was intense hyperemia in the white and the gray substance, with an infiltration of the perivascular spaces by lymphoid elements. Black agglomerations were found at the periphery of the white substance, and pigmentary degeneration of the cells in Clarke's columns. Numerous cells of the anterior horns of Clarke's columns appeared deformed and altered, presenting chromatolysis. The nucleus was peripherally displaced, deprived of its membrane, and sometimes more intensely stained than the cell-body. In some cells the processes were broken. All these changes were the most marked in the cervical enlargement in the bulb. There were small hemorrhages in the floor of the fourth ventricle, and the lesions were less pronounced in the cerebral cortex, the basal ganglia, and the cerebellum and isthmus.

TROPHONEUROSES.

Graves's Disease.—Askanyz³ calls attention to the **atrophy in the voluntary muscles** in Graves's disease with fatty infiltration found in 4 cases examined by the author. The changes were usually distinct to the naked eye. Besides muscle-wasting, the nerve-fibers were pale and difficult to distinguish from the fat. Microscopically, the fat-globules were seen in long rows in the muscle-fibers, which showed increased nuclei. The nuclei also frequently showed degeneration. No change was observed in the intramuscular nerves, spinal cord, and brain. The author looks upon these changes as of toxic origin.

Schwartz⁴ reports 2 cases of exophthalmic goiter treated by **bilateral resection of the sympathetic nerve**. In the first case both nerves were operated at once; in the second case, in 2 sittings. The operation was followed in each instance by much relief; the prominence of the eyeballs became less, the pulse reduced in frequency, and the general symptoms were ameliorated. In the second case, in which the patient had suffered from angular attacks, these were completely relieved. [For other cases, see YEAR-BOOK for 1898.]

¹ Centralbl. f. Bakt., Band 20.

² Arch. de Neurol., Apr., 1899.

³ Deutsch. Arch. f. klin. Med., Band 61.

⁴ Bull. de la Soc. de Chir. de Paris, Nov. 22, 1898.

Infantilism.—H. H. Vinke¹ presents an interesting summary of the use of thyroid feeding in the development of backward children, and reports 3 cases, which are scarcely parallel with the subject, as evidences of myxedema were present in all.

G. R. Murray,² in the Goulstonian Lectures for the year, takes up the **pathology of the thyroid gland**. He first calls attention to the fact that the gland originally was, and in some lower animals still is, provided with a duct, which in the human embryo opens at the foramen cecum on the base of the tongue. It is evident, therefore, that at one period of human existence it has a secretory function connected with digestion, which explains the activity of thyroid feeding. This also serves to demonstrate that the thyroid practically secretes material which is essential to the economy, and has not primarily as its function the destruction of some noxious element. He believes that the secretion is a complex body made up of several important constituents, as it is in that form that it mingles with the blood, and they are all contained in the colloid material. He is inclined to think that the varying results of thyroidectomy depend upon the difference in the function of the thyroid and the parathyroid glands. It is only when the parathyroids are removed that tetany supervenes. This can be proved in animals, in which they can be separately extirpated. In the human body the parathyroid is enveloped in the thyroid, and consequently is universally sacrificed. The nervous symptoms which follow the removal of the parathyroids in animals are not controlled by the administration of thyroid extract or thyroïdin, which, however, control the myxedema, leaving the other group of nervous symptoms intact. The changes in the gland in primary myxedema, according to the older views, is regarded as a chronic inflammation, a chronic interstitial thyroiditis, as a result of which new fibrous tissue is formed, and the slight constriction of the bloodvessels leads to destruction of the epithelial cells. He thinks it more probable that the atrophy of the glandular tissue takes place primarily as the result of the action of some toxic agent, and that the fibrosis is only a replacement-fibrosis, such as occurs in the spinal cord and elsewhere after more highly organized structures have been destroyed. In ordinary myxedema in man the parathyroids are probably not involved, and consequently there is a lack of the tetany which so commonly follows thyroidectomy. In exophthalmic goiter he finds the structure of the gland resembles that of compensatory hypertrophy, there is an increase in the secreting structure, in the change of the epithelium from the cubical to the columnar type; while the secretion in the alveoli is less in quantity and more watery in consistence; and he thinks that the complex symptoms of the disease are due to an excessive formation and absorption of the secretion of the thyroid gland, and its action especially upon the nerve-centers of the medulla. He points to the relationship between myxedema and exophthalmic goiter in that Graves's disease may be followed by myxedema; but he is not aware of any cases in which exophthalmic goiter has developed in a patient already suffering from myxedema, and in some cases the symptoms of exophthalmic goiter diminish as those of myxedema develop. Overaction of the gland eventuates in an athyroidal state. In his opinion, thyroid should never be given in ophthalmic goiter.

¹ Med. Rec., Apr. 15, 1899.

² Brit. Med. Jour., Mar. 18, 1899.

A. Ostwald¹ has investigated the iodine-proteid of the thyroid, and classes it as a globulin, suggesting the name "**thyreoglobulin.**" Its pharmacologic action shows it to have the same efficacy as the thyroid itself on metabolism; and he believes that this globulin is the active principle of the gland. The globulin, with a number of accessory substances, is probably secreted by the gland and localized in the colloid material.

Osteoarthropathy.—W. S. Thayer² reviews several cases formerly reported by him in the *N. Y. Med. Jour.*, and adds another. In his thorough review of the literature of the subject and of the more recent views regarding it, the fact is clearly brought out that this condition, which by Marie was thought to be invariably associated with chronic pulmonary states, might follow other chronic septic disorders. In 43 out of 55 typical cases the affection was not secondary to the pulmonary disorder; that is, not associated with lung-disease, but due apparently to syphilis, valvular heart-disease, chronic diarrhea, spinal caries, and unknown causes. In this connection, reference is made to the case reported in the *YEAR-BOOK* for 1899, which was secondary to gastric dilatation and associated with tetany of similar origin. The author believes that the condition would better be considered as secondary, and that the designation which refers the disease to the lungs should be dropped, joining with Massalongo in recommending the descriptive title "secondary hypertrophic osteoarthropathy." As yet, the intimate character of the toxic substance which acts through the nervous system to bring about the trophic disturbance is not clearly known.

Akromegaly.—L. J. Mitchell and E. R. LeComnt³ present a critical review of the recorded pathology of akromegaly, with the findings in a case first clinically described by Church and Hessert. They call especial attention to the enlargement of the viscera, not only in this case, but in other reported instances. The liver has been found enlarged in 19 out of 27 cases in which the condition of the liver is described. The spleen, the kidneys, and the heart have all been found enlarged. The thyroid has been found reduced in size 4 times, and normal 5 times; while in the remaining cases in the literature no mention of its condition is made. The thymus has been noted as absent 18 times. The hypophysis is enlarged, as a rule; and sarcoma and adenoma are its most frequent changes. In closing their very meritorious critical investigation of the subject, they reach the following conclusions: 1. The cases of akromegaly associated with true tumor of the hypophysis are certainly not so numerous as has been heretofore supposed. 2. There is not so much constancy in the pathologic condition of the hypophysis as there is in an enlargement of the heart, the thyroid gland, or the sella turcica. 3. Akromegaly does not depend, at least not solely, upon abolition of any function of the hypophysis. 4. A relationship between the thyroid gland and the hypophysis has already been amply proved. 5. It is not at all improbable that proliferation of the histologic elements of the hypophysis may be instituted in some cases by a primary enlargement of the sella turcica; in other cases, an edema or hemorrhage ex vacuo. 6. We have no reason for supposing that enlargement of the sella turcica may not be

¹ *Zeit. f. physiol. Chemie*, 1899.

² *Phila. Med. Jour.*, Nov. 5, 1898.

³ *N. Y. Med. Jour.*, Apr. 15 and 22, 1899.

as constant an occurrence in akromegaly as the changes in other bones, or that it might not take place from a similar cause or causes.

R. H. Cunningham¹ reports a case of **akromegaly in a dog**. The dog was about a year old and presented bony enlargements of a characteristic nature. Upon section there were found interstitial involvement of the thyroid, hypertrophy of the thymus, and enlargement of the hypophysis cerebri.

M. de Cyon² has treated a case of akromegaly with **hypophysin**. The case was a boy of 12 years, who presented a body-girth of 115 cm., and weighed 54 kg. From the third year of his life he complained of headache and presented nystagmus. He was apathetic and of small intelligence; his pulse was weak and irregular. After 6 or 7 weeks of treatment with hypophysin, there was improvement; his weight was reduced to 45 kg.; his body-girth to 80 cm.; headache and nystagmus ceased; intelligence and pulse were improved. [The brief notes of this case would indicate that it was not free from myxedema, which may explain the improvement under the hypophysin treatment, as similar results in akromegaly have not been obtained by other observers.]

C. W. Burr and David Riesman³ report a case of **tumor of the hypophysis without akromegaly**. The glandular portion of the hypophysis was not completely destroyed by the tumor, which had attained the size of a hen's egg; and the authors are inclined to believe that in other cases of pituitary tumor not associated with akromegaly the glandular portion may have escaped, and that their case is really confirmatory of the intimate relation between pituitary tumor and akromegaly.

Raynaud's Disease.—D. Durante⁴ reports 2 cases of fatal symmetrical asphyxia of the extremities, 1 of extensive gangrene in children of syphilitic parents. He does not look upon the syphilis as the cause, but considers the disease one of a purely nervous character. One case was brought to section, but nothing peculiar was found.

Angioneurotic Edema.—B. Onuf⁵ reports 7 cases of this neurosis, and believes that it has a close affinity with urticaria and fugitive neurotic erythema.

PSYCHONEUROSES.

Neurasthenia.—Bedon⁶ publishes the results of examinations in 200 cases of neurasthenia, both as to antecedents and descendants, as well as to other matters pertaining to the etiology. In all cases the intensity of the proximate determining cause was inversely proportional to the hereditary predisposition. Particular interest attaches to his investigation of the children of 147 married neurasthenics, who had 152 offspring, out of which number probably only 33 were normal; 24 died of eclampsia, 20 with physical ailments, including arthritism, marasmus, infantile paralysis, tuberculosis, chlorosis, scrofula, etc.: 87 died with psychical blemishes, including bizarre or impulsive traits, hysteria, neurasthenia, idioey melancholia, dipsomania, stammering, and vagabondage. This list of offspring shows that neurasthenia in a parent is the starting-point for various kinds of physical and mental degeneracy in the children. Neurasthenia, like

¹ Jour. Compar. Med., July, 1897.

³ Jour. Nerv. and Ment. Dis., Jan., 1899.

⁵ Med. Rec., July, 1899.

² Presse méd., 1898.

⁴ Med. Infantile, No. 7, 1898.

⁶ Arch. de Neurol., May, 1899.

arthritis, is a dyscrasia associated with town-life, and, unless strengthened by the admixture of healthy rural blood, tends to extinguish the family through sterility.

F. Pick¹ reports the result of a number of experiments, the purpose of which was to determine the ordinary **changes in the nerve-cells due to fatigue** and following stimulation. He exposed the brain in monkeys and cats, under narcosis, and irritated the motor zone with the faradic current for a half-hour or more, producing contractions on 1 side only of the body. While the irritation was maintained the spinal canal was opened, and the segment necessary for certain movements was determined by successive division of the spinal roots or the spinal cord. Sections from this level and other portions were stained by the methods of Nissl and Golgi. Irritation in these experiments took place at a distant point, and as only the cells of one side were irritated, contrast was furnished by the condition of the corresponding cells on the opposite side. Cells stimulated in the manner described presented chiefly a peripheral chromatolysis, and Pick is inclined to accept the view that the chromatic substance is reserve material, disappearing during activity. The cells were also of irregular contour and contained shrunken nuclei. J. Luxenburg² refers to the work done in this direction by Daszkiewicz, Hodge, Vas, Lambert, G. Mann, Lugaro, Magini, Valenza, Pergens, and Pognat, giving a short outline of their various findings and the different conclusions to which they are led, and then reports his own work on this subject, which consisted in experiments upon rabbits and dogs. In each instance, after narcosis was induced, the cord in the lumbar region was divided longitudinally, separating the halves, and then cross-sectioned, cutting off the influence of the superior centers. One sciatic nerve was then exposed and stimulated with a faradic current for an hour, with intervals of rest of 5 minutes after every 5 minutes of stimulation. The animals were then killed, and the specimens examined by Nissl's method. He concludes: 1. That the chromatin-substance of the motor cells of the cord is related to the potential energy. 2. That activity in the motor cells shows morphologic changes, especially in the chromatin-substance. 3. That the size of the cell-body and of the nucleus during activity remains practically unchanged, but that the nucleolus is enlarged. 4. That the position of the nucleus in relation to the cell-body remains unchanged. 5. That the protoplasmic matter of the nerve-cell takes part in its activity. He also refers to the recent publication of somewhat similar experiments by F. Pick,³ which agree practically with his own, except that Pick frequently noticed changes in the nucleus and nucleolus.

Urban⁴ describes a hitherto unmentioned **pulse-phenomenon in neurasthenia**. If the patient bends forward or makes an attempt to sit down a distinct slowing of the pulse takes place, returning to normal in a very short time, whether the patient assumes an erect position or not. Often neurasthenics with rapid heart show this condition, which is not present in healthy individuals. Urban attributes it to the irritability of the vagus. It fails to appear in the tachycardia of other conditions.

Morton Prince⁵ discusses what he calls the **educational method**

¹ Deutsch. med. Woch., No. 22, 1898.

² Neurol. Centralbl., July, 1899.

³ Deutsch. med. Woch., No. 22, 1898.

⁴ Wien. klin. Woch., 1898.

⁵ Boston M. and S. Jour., Oct. 6, 1898.

of treatment in neurasthenia, which he summarizes as follows: 1. Instruction of the patient in the nature of the symptoms and disease. 2. Fixed ideas, apprehension, and erroneous beliefs counteracted; faulty habits of temperament and character corrected. 3. Individual symptoms suppressed by electricity, suggestion, and other therapeutic agents. 4. Rules given for daily conduct. 5. Improvement of nutrition, moderate rest, and in extreme cases isolation from previous surroundings only.

Hysteria.—J. P. Karplus,¹ after a protracted study of the condition of the pupil in hysteria, reached the conclusion that it fails to respond to light in a very large proportion of the cases during marked hysteric accidents, and believes that a diagnosis of epilepsy in convulsive seizures, based upon the condition of the pupil as differentiated from hysteria, is a very serious mistake. He also finds that fixation of the pupil may appear with minor hysteric attacks, which are only marked by disturbance of respiration or swallowing, and slight disturbance of consciousness may be found. W. G. Spiller² reports cases of hysteric hemiparesis, in 1 of which there was well-marked **rigidity of the pupil**. In this connection he refers to the literature on the subject of pupillary fixation in hysteria.

Casey Wood,³ in an able article on the **ocular evidence of hysteria**, reaches the following conclusions: 1. Most cases of hysteria present well-marked, easily detected eye-signs and symptoms. 2. A few ocular symptoms, such as reversal of the relation of the color-fields and the field for white, the tonic form of blepharospasm, spasm of accommodation and convergence, and pseudoparalytic ptosis, may be regarded as pathognomonic of hysteria. 3. Defects of vision (in the absence of refractive errors, accommodative anomalies, and fundus lesions) are, generally speaking, hysteric if accompanied by photophobia and any form of blepharospasm. 4. No examination of a patient for hysteria should be regarded as complete without considering the condition of his ocular apparatus. 5. When there is no conclusive external evidence of the neurosis present, the perimeter should be carefully used, the range of accommodation should be noted and the ophthalmoscope employed. 6. It should always be remembered that ocular hysteria is common in children and men. 7. Organic disease (traumatism especially) of the eye may accompany purely functional disturbances of that organ.

Mathieu⁴ calls attention to the association of **polyuria and hysteria**; and Babinski made out that diabetes insipidus sometimes means hysteria itself, all the other and more familiar symptoms being absent. Suggestion, Mathieu finds, may make the hysteria disappear. A patient who passed about 42 pints of urine daily was cured by small doses of table-salt, which had been substituted for the phenacetin originally prescribed, without the patient knowing that a change in the medicine had been made. [A number of cases of polyuria, and even of diabetes mellitus, have been known to be markedly modified in the excretion both of the quantity of water and of sugar by suggestion taking the direction of treatment of the eye-muscles, etc., the patient meanwhile being allowed an ordinary diet.]

¹ Jahrb. f. Psych., 1898.

² Phila. Med. Jour., Jan. 14, 1899.

³ Am. Jour. Med. Sci., Jan., 1899.

⁴ Progrès méd., Feb. 18, 1899.

Crocq and Marlow¹ report a case of hysteria **simulating apoplexy and hemiplegia** very closely. A woman of 23, after typical convulsive attacks of hysteria, presented an apoplexy. She remained 48 hours in a comatose condition, with stertorous breathing, left-sided hemiplegia, right-sided weakness of the lower face and tongue, and full anesthesia. After about 36 hours, contracture occurred in the lower extremity; consciousness returned on the second day; the third day sensibility was normal on the sound side and also in the face, while the paralyzed side remained 'anesthetic. Under daily faradization all symptoms rapidly subsided, so that 10 days later the patient appeared to be perfectly well. The reporters naturally emphasize the difficulty of making a diagnosis of hysterical apoplexy when it presents such a complete resemblance to the manifestations of organic disease.

H. Dippe² reports the case of a woman of 43, who as a girl presented hysterical attacks at the menstrual periods. In 1896, after an accidental blow, she presented a fever with morning remissions and great tenderness in the hypochondrium, supposed to be due to **peritonitis**, and leading to the idea of some suppurative process, but without physical signs. In 1897 she had hysterical attacks—crying, groaning, sighing, convulsions, unconsciousness, etc. At the end of January of that year the fever ceased and the hysterical symptoms subsided. All the bad symptoms were reestablished in February, and operation was then decided upon, on the day preceding which the temperature reached 107.6° F. The abdomen was opened, and to everyone's astonishment nothing but normal conditions were found. The vermiform appendix, which contained some fecal fragments, and both ovaries were removed. Fever, pains, and hysterical attacks ceased as by magic, the patient was reassured, and made an excellent recovery.

F. R. Fry³ calls attention to the **transfer of tactile to visual sensations**, and refers to the well-known experiments of Binet. In a hysterical girl of 14, with right-sided anesthesia, who presented delirium and hallucinatory states, with hemiopic hallucinations and monocular diplopia, the phenomenon was easily elicited. She was directed to look at a plain white surface, the wall at the left side of her bed, and describe the objects she could see there. He then traced on the anesthetic right arm and forearm various geometric figures—triangles, squares, circles, etc.—which she named without hesitation, although care was taken to see that she knew nothing of the manipulations. The tracings were made lightly with the finger or an ordinary lead-pencil. When directed to look at a colored screen during the tracings, she saw the figures surrounded by the color complementary to the one before her. For instance, in looking at a blue screen she saw the figures in a red field. Small objects placed in the anesthetic hand, and the hand closed upon them, were seen upon the screen; as, for instance, an open match-box.

Epilepsy.—Rosier⁴ makes a study of **epilepsy in advanced years**. The author believes, with Féré, that in such cases there is a latent hereditary tendency which, under any influence such as alcoholism, syphilis, or any disease, may induce epilepsy. Even ordinary arterial sclerosis may induce the seizures very late in life in the presence of such a

¹ Jour. de Neurol., 1898.

³ Jour. Nerv. and Ment. Dis., Aug., 1899.

² Deutsch. Arch. f. klin. Med., 1899.

⁴ Thèse de Paris, 1898.

tendency. The seizures, as a rule, are characterized by intellectual failure, and in many instances senile dementia supervenes. [It seems unnecessary to class these seizures as a form of epilepsy. They would better be recognized as symptomatic of degenerative changes secondary to arteriosclerosis. See also YEAR-BOOK for 1899.]

Dide¹ calls attention to the etiologic role in epilepsy sometimes played by **typhoid**. Not only does it evoke epilepsy in those of neurotic predisposition, but in occasional instances also gives rise to epilepsy in those who are free, as far as can be ascertained, from any such tendency.

L. P. Clark² devotes an article to the subject of **tetanoid seizures** in epilepsy, of which the main conclusion is that they may be encountered, and are but a modification of true epilepsy, with no practical relation to tetanus. He does not recognize the variety of epilepsy described by Pritchard under the term "tetanoid epilepsy."

Marchand³ has made a study of the pulse and **temperature in attacks** of ordinary epilepsy, epileptic vertigo, and hystericepilepsy, and concludes as follows: 1. The rise of temperature is noticed 10 minutes after a fit in epilepsy, attains its maximum in 20 minutes, and this elevation lasts 10 minutes. 2. The epileptic attack causes an elevation of internal temperature of 0.5° C. 3. Epileptic vertigo causes less marked, but still a noticeable, rise of temperature. 4. The epileptiform attacks of general paresis present a corresponding elevation of temperature. 5. There is no relation between maximum temperature and the age of the patient; and various temperatures may be observed in the same patient at different times. 6. The pulse rises about 31 beats above the normal in an epileptic fit, and 50 minutes after the fit it has again fallen to normal. The maximum pulse-rate appears 15 minutes after the attack, and is maintained for 5 minutes. 7. Both pulse and temperature subside to normal steadily or with only slight oscillations. 8. In epileptic vertigo the pulse rises in proportion to the intensity of the attack. 9. In hystericepilepsy he notes an increase of temperature of 0.4° C., the elevation lasting 35 minutes, with a ratio between the length of the attack and the elevation of temperature. In two-thirds of the cases the temperature is at its maximum at the beginning of the period of passional attitudes; and in other cases it continues to rise for about 43 minutes. The duration of maximum temperature is 8 minutes, and the fall is afterward gradual. The pulse in epilepsy raises 57 beats, and the acceleration lasts 24 minutes, the maximum of intensity at the beginning of the attack (epileptoid period) subsiding irregularly and with decided oscillations. 10. There is no relation between the duration of the hysteric attack and the maximum acceleration of the pulse. 11. On the whole, the pulse-disturbances are more marked than the temperature-changes in hystericepilepsy.

A. P. Ohlmacher⁴ reports upon 5 additional cases of epilepsy which tend to confirm his contention regarding the importance of **the lymphatic constitution** in this disorder. These 5 cases presented genuine grand mal, with prominent evidence of the lymphatic constitution. They were the most typical examples of idiopathic epilepsy out of 19 examined postmortem. All 5 cases died suddenly, presenting good general nutrition. The remaining 14 cases included examples of secondary epilepsy,

¹ Rev. de Méd., Feb., 1899.

² Am. Jour. Insan., Apr., 1899.

³ Thèse de Paris, 1899.

⁴ Bull. Ohio Hosp. for Epileptics, July and Dec., 1898.

of idiocy, infantile paralysis, etc., and of genuine epileptic insanity, with death after gradual wasting, where, if lymphatic hypertrophies or remnants had persisted, they had, it is presumed by the author, disappeared in the general emaciation. A persistent thymus, with all the histologic characteristics of lymphoid activity, was the prominent anomaly in the 5 cases mentioned, accompanied by general lymphatic hypertrophy. In all instances the lumen of the aorta was less than in average healthy adults. Three of the 5 cases showed the deformities of old rickets, and indications of thyroid disease appeared in 4. The author believes that on morphologic and physiologic grounds a relationship is suggested between genuine epilepsy and rickets, infantile convulsions, thymic asthma, thymic sudden death, tetany, and possibly exophthalmic goiter. For the report of previous cases the reader is referred to the YEAR-BOOK for 1899.

P. Galante¹ reports observations in 16 epileptics looking to the determination of **albuminuria** subsequent to the attack. All the subjects were young and vigorous, with no evidence of cardiac or renal disease. Albumin was constantly found in the urine after epileptic seizures. The duration of the albuminuria was from 4 to 8 hours, sometimes 12 or more. The more violent seizures were, in general, followed by more albumin; but a series of attacks did not lead to corresponding increase. Slight attacks of vertigo were not followed by albuminuria. The author explains the albuminuria (1) by renal stasis secondary to the initial tonic stage of the fit and to the dyspnea of the second stage; (2) by cerebral excitation; (3) by excitation in the albuminuric center in the bulb; (4) by the action on the renal epithelium of the increased nitrogenous products and the increased toxic products from the intestine; (5) by the intense muscular contraction with temporary rise of temperature.

William P. Spratling² reports a case of epilepsy in which 519 seizures occurred in 49 hours—a **limited status epilepticus**. They all commenced in the same manner and in a limited area. The right thumb was first flexed into the palm, then clenched by the fingers; then the wrist was flexed, and eventually the arm was involved and the attack became generalized. The patient finally died, and the brain, on inspection, showed nothing abnormal, not even an engorgement of the bloodvessels, but, on the contrary, was rather pale. The convolutions of the right-hand and thumb-centers were macroscopically negative. Unfortunately, the specimen was spoiled in transit. In his report upon it, however, Van Gieson remarks: "After all, no one has yet discovered the changes due to epilepsy; and we can hardly expect to find it on the spur of the moment to-day. All that have ever been found, after 8 years' work at the thing, are evidences of premature aging of the ganglion-cells in the motor cortex; and this I cannot formulate dogmatically."

W. von Bechterew³ describes epileptic and epileptoid attacks taking the form of **sudden anxiety**. He concludes, from a study of the subject: 1. That attacks of anguish or anxiety in the course of epilepsy are rather common. 2. That they may appear as preepileptic auras, or as equivalents of epileptic attacks, with which they may alternate. 3. Commonly, the epileptic attacks of anxiety are without loss of consciousness. 4. They are especially rebellious to medical management. 5. Sometimes

¹ Jour. Ment. Sci., Apr., 1899.

² N. Y. Med. Jour., Mar. 18, 1899.

³ Neurol. Centralbl., Dec. 15, 1898.

paretic dementia is observed in the course of this epileptic form. 6. These attacks of anxiety are distinguished from those of common neurasthenia by their sudden onset and lack of association with fixed ideas, such as claustrophobia, agoraphobia, etc.

F. X. Dereum,¹ in the treatment of epilepsy, prefers **ammonium bromid** as the least depressing of the bromid preparations. Antipyrin associated with it increases its activity, so that 15 gr. will often be found as efficacious as 30 or 35 gr. used alone, and without unpleasant after-effects. To guard against mental depression and eruption, various iodids may be used. Sulfonal he finds of value in nocturnal epilepsy, 5 to 10 gr. often preventing its occurrence, and sometimes also preventing its appearance during the day. Acetanilid, in doses of 4 to 6 gr. after meals, has been found of benefit. This, he thinks, acts as a germicide, preventing fermentation, and may also clear the intestinal canal of noxious substances. Frequent bathing, physical exercise, outdoor life, and all measures which increase excretion and elimination are emphasized.

S. Haslé² reports clinical observations made in the use of **camphor bromid** in the treatment of epileptics, and strongly advocates it in the treatment of petit mal, but finds it inferior in value to the mixed bromids in the management of major attacks. He begins with moderate doses, gradually increasing; and prefers to administer it in capsules, in order to overcome the disagreeable odor. Two capsules of 20 cgm. each are given a day, increasing 2 capsules the second week, etc., until 8 capsules are taken daily, when he gradually diminishes the dose to 2 capsules a day, and maintains this dosage according to the requirements of the case.

The effect of **bromid upon the brain-cells** has been studied by E. Crisafulli.³ Bromid was given in daily doses of 90 cgm. to every kg. of body-weight in the dogs experimented upon, and continued for varying periods of time. The dogs were killed at varying intervals after the discontinuance of the drug. The brain-cell changes were proportional to the amount of the poisoning and also to the symptoms produced during life. The cortical cells are disturbed by the bromid, but apparently, even after marked effect from bromid exhibition, are capable of recuperation. In general, the cells were found vacuolated and somewhat atrophied, and many cells in the severer cases were entirely destroyed.

C. Rossi⁴ reports a very interesting series of experiments to determine the value of various remedies in controlling the irritability of the cerebral cortex. Dogs were trephined, and the amount of electricity required to excite the cortex was carefully noted. After the wound had thoroughly healed various therapeutic substances were exhibited, and the skull was opened anew on the opposite side, and again the excitability of the cortex tested. Under this test borax was found to be entirely inert as far as controlling the irritability of the brain-cells was concerned. Opium and bromid in the Flechsigs mixture reduced the excitability of the cortex very materially, and also rendered it inert to the action of absinthe and the local action of creatin. But opium used alone proved to have very little effect in reducing the excitability of the cortex, whether it were irritated by electricity, absinthe, or creatin. Bechterew's mixture of bromid and *Adonis vernalis*, also with codein, gave similar results,

¹ Med. Fortnightly, 1899.

³ Ann. di Nevrol., vol. xiv.

² Thèse de Paris, 1899.

⁴ Riv. speriment. di Freniatri, xxiv.

but upon separating the ingredients the bromid alone appeared to be the active restraining agent.

Hessler¹ reports the case of a chronic epileptic, in asylum practice, who had from 45 to 70 severe attacks in a month, and was attacked by erysipelas of the face. After his recovery from the erysipelas the convulsions practically ceased. Hessler then gave hypodermic injections of **erysipelas-antitoxin** in the case of an epileptic of a hopeless chronic type, who was having from 1 to 4 convulsions a day. A marked diminution in the number of the fits followed for a time. Three other patients similarly treated were benefited, but the remedy was discontinued on account of the expense. No evil effects were observed.

Wislocki² advocates the **milk-diet**, and has noted complete disappearance of attacks in some and decrease in many other cases under this regimen. [It may be highly recommended.]

Th. Jonnesco,³ in 15 of 35 cases of epilepsy in which total bilateral **excision of the sympathetic ganglia of the neck** was done, and in which the course of the disease was followed for a reasonable time, reports that 2 were without result, 4 improved, and 9 were cured. Of these 9, 5 had gone a year and a half; 1 13 months; and 3 from 9 to 12 months, without recurrence of the attack. [It is needless to say that cases put down as cured after an interval of 9 or 12 months show mental bias on the part of the reporter.]

Again Jonnesco⁴ has done **resection of the cervical sympathetic** on 61 patients for epilepsy, exophthalmic goiter, and glaucoma. For epilepsy and exophthalmic goiter he insists that nothing short of complete resection of the 3 cervical ganglia, with the intercommunicating branches on both sides, is likely to be of the least service. Of 42 patients on whom the complete operation was done, 6 died from causes not in any way due to the operation. He now allows about 8 days to intervene after one side is operated before the opposite side is attacked. Of 10 patients suffering from exophthalmic goiter the author reports 6 cures, the remaining 4 being considerably relieved. In only 18 out of the 45 cases of epilepsy does he consider sufficient time to have elapsed since the operation to permit of any conclusions. Of these 18 patients, 10 are said to have been completely cured. The longest period is 2 years, and the shortest 6 months. In 2 cases the operation failed to give relief. In glaucoma the author removes only the first cervical ganglion. In 4 out of 8 cases the operation improved the sight and relieved pain. In the other 4 cases, 2 of chronic and 1 of recurrent acute glaucoma, sight was not improved by the treatment. [Carl Beck⁵ reports several cases of epilepsy in which this operation was done, with negative results.]

J. A. Donath⁶ finds that the division of the sympathetic in the neck, after the manner of Jonnesco, is without value, and in some instances quoted was followed by an increase in the paralytic attacks.

J. M. Ball, E. C. Renaud, and W. Bartlett⁷ report a case of **glaucoma** in which excision of the superior cervical ganglion of the sympathetic on the same side was done, with immediate relief; and refers to 8

¹ Indiana Med. Jour., Nov., 1898.

³ Gaz. des Hôpitaux, No. 45, 1898.

⁵ Chicago Med. Recorder, 1899.

² Gaz. Lakarska, No. 19, 1899.

⁴ Centralbl. f. Chir., No. 6, 1899.

⁶ Wien. klin. Woch., 1898.

⁷ N. Y. Med. Jour., July 1, 1899.

cases, similarly operated by Jonnesco, which resulted immediately in lessening of ocular tension, particularly marked in 4 cases, vigorous contraction of the pupil, disappearance of periorbital pain and headache, disappearance of attacks in irritative glaucoma, improvement in sight, and increase in the size of the field of vision in those cases in which visual sharpness was still present and the atrophy of the papilla not complete. Ruggi¹ reports 10 cases of glaucoma treated by removal or partial removal of the sympathetic ganglia in the neck. In the majority of cases the pain was speedily relieved, but reappeared in a less degree. The cases were all operated upon within a year, and final results cannot yet be known. [These cases are quoted as bearing upon the operation in cases of epilepsy.]

Migraine.—Franz Pfaff² reviews the subject of **paraxanthin-poisoning**, as elaborated by Rachford, and reaches, after a very careful investigation, entirely opposite conclusions. He believes that the results obtained by Rachford by the injection of his final fluids was due to the ammonium chlorid contained, rather than to the paraxanthin.

Night-terrors.—Rey³ found **adenoid vegetations** present in all of 32 cases of night-terrors, which subsided after the removal of the vegetations. He is inclined to believe that adenoids are the most frequent cause of this disturbance, acting by the production of carbonic-acid poisoning.

E. J. Little⁴ contributes an article on the subject of night-terrors, and makes a study of 30 cases. He found the peculiar circumstance that 17 presented definite **valvular murmurs** of the heart. Of the other cases, 2 had increased frequency and **irregularity of the heart's action**; 5 presented **enlarged tonsils, with adenoids**; and 2 **chronic rhinitis**; in 2 there was obstinate dyspepsia; and in only 1 case was there a history of previous epilepsy. His conclusions are as follows: 1. Night-terrors are in the great majority of cases caused by disorders productive of **moderate but prolonged dyspnea**. 2. A preponderating number of cases are found in rheumatic subjects with early heart-disease. 3. A considerable proportion of cases are due to obstruction of nasal cavities and fauces. 4. Digestive disturbances do not play the important part in causation that is often assigned them. 5. The evidence of causal connection with epilepsy or allied neuroses is scanty. 6. The attacks occur in the subconscious stage of early sleep, and are confined to children under puberty.

NEUROSES WITH MOTOR SYMPTOMS MAINLY.

Parkinson's Disease.—Ballet and Faure⁵ describe certain lesions of the cells of the spinal gray matter in a case of paralysis agitans. They found in the cells of the anterior horns a considerable number of ruptures of the protoplasmic prolongations. Similar ruptures are found in acute myelitis, experimental anemias, and as a result of manipulation, but are supposed in the present instance to indicate an abnormal fragility of the protoplasm.

¹ H Policlinico, May 15, 1899.

² Boston M. and S. Jour., June 22, 1899.

³ Arch. f. Kinderh., Band 25.

⁴ Brit. Med. Jour., Aug. 19, 1899.

⁵ Arch. de Neurol., Feb., 1898.

Philipp¹ reports a case occurring in a woman at the age of 60, presenting the usual clinical symptoms, who died after 3 years of the disease, as the result of nephritis. The examination of the nervous system, which was made with the greatest care and the use of all modern stains, section being made 5 hours after death, showed practically no abnormality except a little pigmentation in the motor cells of the cortex and cord.

Charles L. Dana² makes a contribution to the **anatomy** of this disease, and says that the changes may be summed up as follows: Some general atrophy of the cord, moderate increase in connective tissue, and dilatation of perivascular spaces; no special thickening of the blood-vessels, either veins or arteries; no meningeal thickening; pronounced changes in the anterior cornual cells, consisting of atrophy of these cells, pigmentation and vacuolization, loss of dendrites, diminution in the richness of the plexus formed by the dendritic processes; the process most marked in the upper cervical and lower dorsal regions; Clarke's column is not markedly affected; the brain-cortex shows slight degeneration of cells; the olivary nerve-cells degenerated; the peripheral nerves normal; the muscles and end-plates showing some fatty degeneration. He also says that the clinical facts and pathologic examinations in cases of paralysis agitans lead one fairly to infer that the incidence of the attack falls (1) upon the dendrites of the cells of the anterior horns of the spinal cord or (2) else upon the end-brushes of the neuraxons that come from the voluntary motor tract and the cortical motor centers of the brain. We might in the latter case establish even a sort of analogy between paralysis agitans and locomotor ataxia. Thus, while in locomotor ataxia the effect of the pathogenic poison is to produce a degeneration of the axis-cylinder of the posterior spinal ganglion-cells, this degeneration often apparently beginning in the periphery, and not closely involving the cell-body at first, in paralysis agitans the special poison affects the end-brushes of the axis-cylinders of the cortical cells of the brain, producing a destruction of them, but not involving the main trunk of the axis-cylinder.

And further, "Sometime in the career of these cases the patients have been subjected to an infection or poison, from which they have recovered. It has, however, left the imprint upon certain groups of cells and neuronic mechanisms, and when the degenerative period of life comes these less viable structures begin to go to pieces. What the primary infection in paralysis agitans is I do not know, but perhaps some autochthonous poison allied to that of rheumatism. At any rate, there is no other preceding history that is so often obtainable as one of rheumatism; there are many facts in the clinical history of the disease which suggests a relationship between paralysis agitans and that form of rheumatic manifestation which is known as rheumatoid arthritis."

Purves Stewart³ reports 28 cases of paralysis agitans, 17 in men and 11 in women. The age of **onset** in his series was from 22 to 73 years. A **family history** of nervous disease was obtained in only 6 instances, in 4 of which there was epilepsy or insanity, and in 3 of these cases a relative had suffered from paralysis agitans. In 14 of the 28 cases **stiffness and weakness** preceded the tremor for periods varying from

¹ Deutsch. Zeit. f. Nervenhe., Apr., 1899.

² Am. Jour. Med. Sci., Nov., 1899.

³ Lancet, Nov. 12, 1898.

several weeks to 4 years. In 3 other cases tremor only occurred on excitement or voluntary effort, contrary to the rule. In most cases the symptoms were of **hemiplegic disposition**. In only 2 were the limbs on both sides equally affected. The side which is first attacked usually remains more severely affected. The upper extremities were affected before the lower in 18 of the 28 cases. In reference to **sensory symptoms**, he noted that dull, aching pains in the affected limbs, along with a feeling of stiffness and weakness, often preceded for a long time the rigidity or tremor; and patients often complained of sudden flushes of heat or cold spreading over the body, especially at night. He noted rhythmic **tremors in the face** in 6 instances, especially about the lips; and in 3 cases this was associated with synchronous anteroposterior tremor of the tongue. He notes as a late symptom in advanced cases a **peculiar method of getting into bed**. The patient climbs up on to the bed and stands on it; then bending down very slowly he grasps the rail at the foot of the bed with both hands, and gradually sits down, holding on to the rail all the time. Having reached the sitting posture, he allows the trunk to fall backward into the recumbent posture. Stewart considers this manner of getting into bed characteristic of the condition. In conclusion he calls attention to what he believes to be a hitherto unrecorded symptom, which occurred in no fewer than 5 of his cases. It consists in a peculiar **contraction of the toes**, which takes place early in the disease. The patient complains that when walking the toes of 1 foot become spontaneously strongly curled up under the sole in a cramp-like fashion. This curling of the toes becomes so painful that the patient has to stand still for a minute or 2, until the contraction relaxes. In some cases the contraction spreads to the anterior tibial muscles.

J. Collins and J. J. Muskeens¹ present a clinical study of 24 cases of Parkinson's disease. In 4 there was a straightforward history of **direct inheritance**. Only 2 were hard drinkers or smokers, and in none was there history of syphilis. It was the rule that they had lived temperate, wholesome, quiet lives. They found the early **contraction of the toes**, recently reported by P. Stewart,² in only 1 case. Stewart insists that this is an early symptom in many cases. The type of the disease was generally diplegic, 3 being hemiplegic and 2 tetraplegic. Only 2 of the cases were monoplegic. In 1 case the lower jaw was distinctly affected. Only 1 case was devoid of tremor; in 3 the tremor was distinctly intentional in character. In 4 cases **perspiration** was a very disagreeable late symptom; in 1 instance it was an initial feature.

E. Weill³ reports what he considers to be a case of Parkinson's disease in a girl of 10 years. But the case showed, as the author points out, 3 abnormal symptoms: athetotic movements in the extremities, rigidity on the right side, and right-sided club-foot. [As the condition followed a rather acute attack with cerebral symptoms, the case was probably one of cerebral palsy.]

Koehler⁴ reports a case in which paralysis agitans was a **sequel of fracture** of the lower end of the radius. The patient was a perfectly healthy man of 61, of normal heredity and easy circumstances, and was in no wise excited by the accident.

¹ N. Y., Med. Jour., July 8, 1899.

³ Rev. mens. d. Mal. de l'Enfance, June, 1899.

² Lancet, Nov. 12, 1898.

⁴ Monatsch. f. Unfallheilk., 1899

Fränkel¹ refers to a **change in the skin** in paralysis agitans which he has noted in all cases in which it has been sought. This consists of thickening of the skin, with hidebound tendency, so that there is difficulty in raising it from the underlying structures, reaching such a degree that it is impossible to pick up a fold of it or to cause deep wrinkles in it. It may involve an entire extremity or a portion of it. It is commonly found, however, upon the trunk, and may be symmetrical or otherwise; but from its physical character it is evident that the subcutaneous structures participate in the change. This feature of paralysis agitans calls to Fränkel's mind similar conditions in Graves's disease and myxedema. He is inclined to think that the changes in muscles and skin in Parkinson's disease may perhaps be referable to glandular disturbances of an analogous character, rather than to primary changes in the central nervous system. [Since noting the above, we have found the indicated skin-change in 2 advanced cases, and failed to find it in 6 cases at earlier stages.]

R. Wollenberg,² in his description of Parkinson's disease, lays especial stress upon the **change in reaction-time**, and quotes Borgherini to the effect that there is about 40% of lengthening of the reaction-time between thought and act. In regard to the often-complained-of surface-heat, according to Grasset and Apolinari the peripheral temperature is frequently found elevated; and Fuchs found the surface-temperature increased in nearly 24% of the cases complaining of this feeling of heat.

MENTAL DISEASES.

General Paresis.—L. Wahl³ studies the question of **hereditary antecedents** in general paresis. He analyzed 60 families showing cases of this disease, and found among them that 13 patients had general paralytic parents. Among the brothers and sisters of general paralytics he found instances of stillbirths, abortions in large proportion, and then, in descending order, infantile convulsions and general paralysis, imbecility, and want of mental balance; also syphilitic, choreic, and generally nervous and feeble children. Of the descendants of general paralytics he collected the records of 260 families, with 450 descendants, presenting, stillbirths, 108; died in infancy of convulsions, paralysis, meningitis, rickets, athrepsia, 80; living, 154; while the remainder were suffering from idiocy, imbecility, hereditary syphilis, chorea, tabes, and other affections.

Kérayal and Laurent⁴ report the results of systematic observations in 84 general paralytics and 545 lunatics and epileptic insane regarding the **sign of Biernacki**, which was first described in 1884; namely, the absence of the feeling of pain when the ulnar nerve is pressed upon at the bend of the elbow. They found that tabetic and general paretics exhibited the symptom more frequently than nontabetic patients. Of the 84 general paralytics, 44 gave the analgesic sign, 8 were doubtful, and 32 seemed to have normal sensibility. Among the 542 nonparalytic patients, including melancholia, epileptic insanity, paranoia, etc., they found ulnar analgesia in 87% of demented, 85% of idiots, 40% of degenerates, 32% of melancholics, 30% of paranoiacs, 19% of maniacs, and 10% of

¹ Deutsch. Zeit. f. Nervenhe., Apr., 1899.

² Nothnagel's Specielle Pathologie, vol. xii., Nos. 2 and 3.

³ Thèse de Paris, 1898.

⁴ Arch. de Neurol., Feb., 1899.

alcoholics; while epileptics showed normal feeling in every case. The sign, therefore, if it is worthy the name, is most pronounced in dementia and in tabetic conditions associated with or free from parietic dementia.

Alcoholic Delirium.—K. Bonhoffer¹ gives detail studies of 12 cases, with full necropsies, the central nervous system being studied by the methods of Nissl, Weigert, and Marchi. In the cortex of the central convolutions the cord pyramidal cells were of indistinct contour and presented displaced nuclei. In the small pyramidal cells the nuclei were destroyed, and there was an increase of the small pericellular glia-elements. The small nerve-cell bodies showed marked indistinctness and disintegration, and the nuclei which survived were feebly stained. Similar changes were found in the temporal lobe, and in some instances Purkinje's cells showed irregular chromatolysis.

Ewing² reports on the condition of the central nervous system in 2 fatal cases, aged 25 and 29, respectively. The delirium tremens followed prolonged alcoholic indulgence and intoxication of 6 and 8 weeks, respectively. Section was made 6 and 12 hours after death, and uncovered nearly identical lesions: 1. The spinal large motor cells showed destruction of the chromatic granules. No normal cells anywhere, either in the cord or bulb. 2. The Purkinje cells showed partial destruction of the chromatic bodies. 3. In the cortical pyramidal cells the chromatic bodies were bleached, sometimes granular and indistinct. 4. Throughout the central nervous apparatus there was striking dilatation of the capillaries. The violent nervous symptoms observed are attributed largely to the cellular lesions revealed.

E. Troemner³ has investigated the central nervous system in 7 cases of delirium tremens by means of the Nissl and Weigert methods. He demonstrated arterial sclerosis, venous ectasia, hemorrhages, increase in glial structures, round-cell infiltration, and cell-degeneration. He would sum up the situation as presenting a mixture largely of chronic changes, with acute variations in a minor proportion.

Acute Delirium.—Soelder⁴ reports a number of cases in which acute delirium, presented clinically, was associated with certain postmortem changes, consisting in cerebral congestion, edema and degeneration of the muscles varying in amount, parenchymatous degeneration of the kidneys, and coprostasis in the large intestine. The author reports 6 cases, all in young women or girls. Death appears to be due to cardiac paralysis. Pulmonary congestion and secondary lesions of the mucous membrane of the colon are also encountered. The psychic symptoms consist in alterations of consciousness, difficulty of speech, and muscular excitation, restlessness, delirium, and headache. There is no pyrexia, and a negative condition of the urine. The author's idea of causation is that it is due to an intoxication from fecal accumulation; and for treatment he suggests calomel, with copious enemas and high colonic flushing.

E. Regis⁵ makes a very satisfactory contribution to the subject of **the psychoses of autointoxication**. He strives to bring all varieties of mental disturbance due to autointoxication under a single caption, which may be considered as represented in confusional insanity. He says

¹ Monatsch. f. Psychiat., Apr., 1899.

² Arch. Neurol. and Psychopathol, No. 3, 1898.

⁴ Jahrb. f. Psych., 1898.

³ Arch. f. Psych., 1898.

⁵ Arch. de Neurol., Apr., 1899.

that from a study of his cases and the works on the subject, without exception the psychoses of autointoxication have a special symptomatology and a characteristic type. Among the symptoms, he lays especial importance upon *headache*, which often is an initial feature, and may be prolonged throughout the attack. The headache usually is intense, and in some cases so violent that its paroxysms appear to produce delirium. Second in importance he mentions *insomnia*, which is also an early symptom and a constant one. Less frequently, *convulsive attacks* are encountered early in the case or at some period during the course of the disease, and *catapleptoid attitudes*, *pupillary inequality*, *flushing*, *increased reflexes*, *tremor*, *gastro-intestinal disturbances*, *circulatory disorders*, such as irregular pulse, cyanosis, coldness of the extremities, and secretory modifications, especially affecting the cutaneous area, are observed. Generally the *appearance* is one of bad physical health, and the complexion is often sallow. Emaciation, depression, agitation, and low temperature may be noted. Regarding the mental symptoms, he lays especial stress upon the *torpor*, *confusion*, *amnesia*, and a state of *cerebral automatism* analogous to the dream-state; that is, to a dream prolonged into the waking period. This particular state he designates *hallucinatory onirisme*. He would make several varieties of this psychosis: (1) A simple or asthenic mental confusion; (2) acute and subacute mental confusion; (3) mental confusion with stupor, or acute stupidity; (4) subacute mental confusion resembling the delirium of typhoid; and (5) a mental confusion of a pseudoparalytic aspect. All of these varieties of autointoxication may be observed; but acute delirium is encountered most commonly in autointoxication of gastrointestinal origin, while mental confusion and stupor are more general in hepatic and renal autointoxication. The author puts emphasis upon the analogies existing between the intoxication-psychosis of endogenous origin and those arising from external sources, of which the type is alcoholism. Quoting from the thesis of one of his students, he says: 1. The psychic symptoms of infectious deliriums and those of toxic origin are identical, and present a dream-state or a mental condition analogous thereto: (a) The delirium at first appears at night, and is especially marked during the hours of darkness; it is manifest principally in the sleep-periods, and prolongs itself into the sleep or continues after waking. (b) It is made up of the recollection of previous experiences; but coincidental occurrences may be mingled with the delirium. (c) The hallucinations are especially of a visual character, and generally are terrifying or disagreeable. (d) The delirium is made up of dream-scenes varying greatly, but more or less consecutive. (e) The patient is the actor, and acts as one in the dream of somnambulism. (f) The delirium may be interrupted by any external intervention. (g) The patient loses account of time. (h) Recovery is frequently followed by loss of memory, either for a part or for all of the period of delirium. 2. The identity of the deliriums of infection and those of intoxication is another argument in favor of the toxic origin of all these psychoses. The author then elaborates the idea of the dream-state in the psychoses of autointoxication; and in several instances has been able after recovery, by hypnotizing the patient, to secure a recital of all the acts done during the amnesic period or the intoxication-period of insanity; and he says that he feels empowered to state that toxic delirium is nothing but a somnambulant delirium analogous to other states

of somnambulism of spontaneous or induced origin. In relation to treatment, he first calls attention to the necessity of combating the inciting cause; that is to say, the auto-intoxication or infection, in which direction purgatives, laxatives, antitoxic medicaments, stomach-washings, diuretics, bleeding, intravenous injections in the early stages, and when the poison is at its maximum, are of value; later on, sedatives, baths, and tonics. He thinks systematic bed treatment is of the first importance. In the later stages, when asthenia, both mental and physical, is marked, the treatment is supportative and reconstructive. Hydrotherapy, electrotherapy, frictions, massage, gymnastics, and similar methods are valuable. Prognosis depends largely upon the character and severity of the poisoning; and the termination may be in death or recovery, in chronicity or in terminal insanity. Recovery, however, is the most frequent termination, and may occur even after months and years.

Morphinomania.—N. Macleod¹ reports further² upon the treatment of drug-habits by the use of massive doses of bromid, and gives a number of case-reports. He makes the following claims for the method of treatment: 1. The withdrawal within 3 days of large doses of the drug causing the habit. 2. That this will cause no suffering. 3. The patient cannot deceive in the matter of secret administration, nor can he enlist after the third day the aid of attendants. 4. Any physician, with the aid of vigilant nurses, can deal with a case in the hospital or in a private house. 5. There is no risk of substituting another drug-habit, and the craving will be lost whether the patient desires it or not. The method of treatment is as follows: Having taken the weight of the patient and ascertained that there is nothing to contraindicate this treatment in the way of disease, sodium bromid may be given in doses of 2 drams, in solution, every 2 hours for the first 2 days, and 1 dram during the third day. None is given after bedtime on the third day. Three ounces of the drug in all will suffice. During this time milk alone should be given. Every night and morning during this time the patient is placed on a commode for evacuation of the bowel and bladder, or oftener if there is any sign of soiling the linen. For a week or 10 days after this, sleep, speech, which is at first indistinct, locomotion, which is almost impossible, and the great confusion of ideas will all be seen to improve, the mental condition, however, most slowly. Delusions lessen and memory improves. The sleep may be irregular; but further treatment is undesirable. Solid food is to be given as soon as it can be taken, and the bowels regulated. After locomotion is recovered, exercise should be encouraged. Tenderness in the muscles occasionally appears, but soon passes off. Morphin may be given the first day in the hospital in the habitual dose; half the second day; and none or a very small dose the third day. Chloral may be cut off at once if sleep is good the first night. Cocain may be dealt with like morphin. A case may appear cured in 3 weeks, but at least another 3 weeks, and if possible longer, should be insisted upon, as if for convalescence after a severe illness. A nurse should always be on duty day and night for at least the first 3 weeks.

Mental Disturbance after Operations.—Raynean³ insists that there are many varieties of mental disturbance after operation, as mania,

¹ Brit. Med. Jour., Apr. 15, 1899.

² See YEAR-BOOK for 1899.

³ Jour. de Neurol., Aug., 1898.

melancholia, dementia, hysteria, etc., and that there is no one type of affection that prevails. The evidence seems to be in favor of the view that this disturbance only occurs when there is some hereditary or acquired predisposition; and in many recorded instances mental disturbance preceded the operation. As to exciting causes he mentions moral impression, shock, anesthetics, antiseptics, preceding alcoholism, and septic infection as being the most important. Gynecologic operations are no more likely to cause mental trouble than other forms of surgical intervention, and in any case the complication is rare, not appearing in more than 1% or 2% of all operations.

Serum-feeding (?) of Insanity.—De Boeck¹ recommends that insane patients refusing food should be treated by injections of a normal solution of sodium chlorid, rather than by forced feeding. A fine trocar is plunged deeply into the muscular tissue of the buttock, and a sterilized normal salt solution is then allowed to enter, about a pint at a time being used. In 1 case, a female suffering from excitement and refusing to take food, the injection of 200 gm. in the morning and 300 in the afternoon, daily for 2 days, improved (?) the patient so far that she consented to take food in the ordinary way, and slept well. In another case, in which the patient was similarly treated for a month, but died from exhaustion, the viscera had lost very little in weight. [The difficulties and dangers of this method, the shock to the patient, and the struggle necessitated, as well as the poverty of results, hardly commend this plan of feeding.]

Katatonía.—W. L. Worcester² makes a study of the katatonic symptom-complex, beginning with Kahlbaum's definition, to the following effect: "Katatonía is a disease of the brain, with cyclically changing course, in which the psychical symptoms take by turns the form of melancholia, mania, stupor, confusion, and finally dementia, one or more of which psychical composites may be wanting, and in which, along with the psychical symptoms, processes appear in the motor nervous system, with the general character of spasm." After detailing 9 cases, he concludes, "provisionally, that the katatonic symptom-complex may occur in a variety of morbid conditions, although it is by far the most common in the class of cases to which Krapelin has applied the term 'dementia præcox.' In their bearing on prognosis, such symptoms must be considered at least relatively unfavorable, although long-continued remissions certainly occur, and it hardly seems justifiable at present to deny the possibility of complete and permanent recovery. It is quite possible that cases of recovery may in reality be pathologically distinct from others that resemble them in their symptoms." [This accords closely with the conclusions of Frederick Peterson, quoted in a previous volume of the YEAR-BOOK.]

Melancholia.—A. Athanassio³ presents an interesting study of the eye-conditions in melancholia, and incidentally mentions that melancholia in Bucharest furnishes the astonishingly low number of 8% of asylum population. He calls attention to lowered position of the upper lid and the occasional complete closing of the eye, and its lacrimose appearance, with, however, a relative absence of tears. The lids are

¹ Jour. Ment. Sci., Apr., 1899.

² Am. Jour. Insanity, Apr., 1899.

³ Arch. de Neurol., May, 1899.

sometimes red on their free borders; the movements of the eyes appear to be made with difficulty, especially movements upward. This immobility he attributes to a lack of will-power rather than to absolute weakness. In the majority of cases he has noted the **pupil** to be dilated; but this rule presents many exceptions. The phenomenon of **accommodation** presents particular points, according to this author, who claims to have often observed a reversed Argyll-Robertson; that is, a pupil reacting to light but not to accommodation. He again attributes this lack of pupillary action for accommodation to the loss of will-power. He has observed that **ocular tension** is slightly augmented in cases of melancholia with stupor and in some cases of anxious melancholia. In melancholia with stupor he has many times found a yellowish color of the disk, probably due to anemia or to an edema of the **retina**. The veins of the papilla are dilated, and the arteries may be contracted, but no excavation or other deformity of the papilla is observed. In cases where the investigation was possible he has noted a normal field of vision and unimpaired color-sense.

CUTANEOUS DISEASES AND SYPHILIS.

BY LOUIS A. DUHRING, M. D., AND MILTON B. HARTZELL, M. D.,
OF PHILADELPHIA.

INFLAMMATIONS.

Erythema Multiforme on the Buccal Mucous Membrane after Eating Oysters.—Turner,¹ at a meeting of the Dermatologic Society of London, presented a patient who, after eating freely of oysters, was attacked with severe abdominal pain and diarrhea, lasting 10 days. Simultaneously, the mucous membrane of the lips and gums became very sore, white patches forming. After 16 days the patient got better; but later a new attack came on, accompanied by the formation of "blisters" in the mouth, but without gastrointestinal symptoms. At this time there were also "blisters" just below the knees, on the wrists, and on the backs of the fingers, and a "red rash" covered the palms. After a few days the mucous membrane of the mouth was studded with large vesicles or blebs. On the legs were collapsed, rounded blebs the size of a dime, with concentric formation, and on the heel and external malleolus of the other foot were similar lesions. On the wrists were a few vesicopustules and the remains of blebs symmetrically distributed.

Erythema Induratum of Bazin.—Thiebierge and Ravaut² have studied this disease with care, and arrive at a different conclusion from Dade and Audry. They sum up their views by stating that the *erythème induré* of Bazin—in its nonulcerating form described by Bazin, as well as in its ulcerating form as described by Hutchinson—should be classified with the cutaneous tuberculides, more exactly among the cutaneous manifestations of tubercle-infection due to the bacillus of Koch. It is allied to the tuberculous gummata, with which it has the most pronounced clinical affinity.

C. T. Dade,³ in reporting a case, concludes from the histologic and bacteriologic findings that the disease is not tuberculous, but rather a simple subacute inflammatory manifestation. The case recorded had much in common with *erythema nodosum*. Audry holds the same views as Dade.

Erythromelalgia, with Microscopic Examination of the Tissue from an Amputated Toe.—S. Weir Mitchell and W. G. Spiller⁴ hardened the sections of nerve-fibers in formalin and stained them with hematoxylin. The nerves of the great toe were degenerated. The nerve-bundles were composed almost entirely of connective tissue. In transverse sections hardly more than 3 or 4 nerve-fibers, with axis-

¹ Brit. Jour. of Derm., Nov., 1898.

² Ann. de Derm. et de Syph., June, 1899.

³ Jour. Cutan. and Gen.-Urin. Dis., July, 1899.

⁴ Am. Jour. Med. Sci., vol. cxvii., pp. 1-13, 1899.

cylinders and medullary sheath, could be seen in a nerve-bundle. The connective tissue about these bundles was much thickened. The smallest fasciculi were entirely degenerated. The media of the vessels was thickened and the intima was intensely proliferated. The walls of the veins were also thickened. From these findings and a careful review of the literature the authors conclude that they are justified in attributing the symptoms in this instance to peripheral neuritis. In some cases the involvement of the sensory fibers anywhere between the spinal cord and the peripheral ramifications is capable of causing the disease.

Erythromelalgia.—James Carslaw¹ describes the case of a woman, aged 24, who was admitted to hospital suffering with gastric symptoms and anemia. After temporary improvement under treatment, relapse occurred and the legs began to swell. The swelling was painful and did not pit on pressure. There was elevation of surface-temperature. The feet were unaffected, but the disease extended up the thighs. The condition was aggravated by a dependent position of the limbs. Gelpke's² case of the same disease was a boy 9 years old, of highly neurotic temperament, in whom beginning symptoms of meningitis and cardialgia had appeared. There appeared on his hands and feet first red spots and discrete nodules, with great pain in their neighborhood. Swelling increased until fissures and fibers were formed; finally, fingers were lost as in leprosy. After 6 months of treatment, coincidently with improvement of the nervous condition, pain disappeared and the ulcers healed.

"Rose-spots" in Influenza.—Pelon³ directs attention to the commoner cutaneous manifestations met with in influenza, and states that he has observed the rarer "rose-spots" in 3 cases of influenza, the patients presenting distinct enteric symptoms. The diagnosis made was enteric fever, but this was not substantiated. The author points out the error of regarding these spots as pathognomonic of enteric fever, as they may occur not only in influenza, but also in septic endocarditis, the typhoid form of puerperal fever, and in the enteritis of children.

Koplik's Spots as an Aid in the Diagnosis of Measles.—Sobel⁴ directs attention to the existence of these spots [which, briefly stated, consist of bluish-white spots situated on a reddened background on the buccal mucous membrane] as a preeruptive, pathognomonic, diagnostic sign of measles, as described not only by Koplik, but later by Heubner, Slatoyk, Finkelstein, and others. The author is a firm believer in the importance of this sign in diagnosing measles. His observations are based upon a large number of cases of beginning measles in children, and never has the early diagnosis based on the existence of Koplik's spots failed to find corroboration in the subsequent development of the disease.

Injections of Sodium Bicarbonate in Internal Urticaria.—Mahis⁵ has obtained good results from the use of sodium bicarbonate by the rectum in a neuroarthritic patient subject to urticaria of the mucosa, in connection with external eruptions. When the attack was markedly severe the following was used: Sod. bicarb., 20 gm.; wine of opium,

¹ Glasgow Med. Jour., p. 438, Dec., 1898.

² Correspondenz-Bl. f. schw. Aerzte, Jan., 1899.

³ Presse méd., No. 33, 1898.

⁴ N. Y. Med. Jour., Oct. 15, 1898.

⁵ Am. Medico-Surg. Bull., July 25, 1898.

30 drops; boiled water, 500 gm. Recovery took place in a few days under this treatment.

Urticaria with Recurrent Hematemesis.—Chittenden¹ reports the following case: An unmarried female, aged 33 years, suffered from attacks of urticaria which, at first, differed in no respect from the usual type; but later these grew more severe, being accompanied by swelling of the lips, tongue, and nasal mucous membrane, and dyspnea lasting 3 or 4 hours. These attacks usually lasted about a week. Some 3 or 4 months after the beginning of the attacks the patient was seized with severe nausea, and vomited large quantities of blood; this was followed by immediate relief, and the urticaria disappeared within a day or two. Two months later there was a similar attack, the hematemesis being followed, as before, by rapid disappearance of the eruption. In subsequent attacks, which were much milder, there was no hematemesis, but melena was present. In the way of treatment, change of air, with absolute rest and freedom from worry, seemed to give the best results.

Eczema.—Malcolm Morris,² in a discussion upon this subject, defines **eczema** as follows: It is a disease the most striking clinical character of which is the infinite variety of lesion by which it displays itself; originating in the action of parasites on a skin the resistance of which has been enfeebled by preexisting disease or structural abnormality or by disordered innervation; sometimes made more intractable by gout and other constitutional states, but having no direct relation to the general health.

Beatty³ finds some difficulties in the way of accepting the **parasitic theory of its origin**. It is not infectious, and in some instances seems to be kept up by constitutional conditions. Unna's monococci, which are supposed to be the active agents in its production, are also found in psoriasis.

Leredde⁴ regards all the commonly accepted causes of eczema, such as gastric derangements, disturbances of the nervous system, external irritants, as simply preparing the soil for **microbic invasion**, which is the real cause of the malady, the special organism concerned being the monococcus.

The Treatment of Eczema.—Leredde,⁵ after cleansing the diseased surface of crusts, applies simple dressings, such as **simple boiled water** in acute eczema, **fresh lard**, which he esteems the most useful of all the fatty bodies, in acute eczema, or **caoutchouc**. The employment of this last application is indicated in acute forms of the disease, except under certain circumstances, and in almost all chronic forms. If it produces irritation or the least suppuration, it must be removed and the moist dressings substituted. In certain cases of acute eczema an aqueous solution of **picric acid**, 1 : 200, may be applied on compresses; or ointments of **salicylic acid**, oil of cade, or **resorcin**, in strengths varying from 1% to 3%. In inveterate chronic eczemas accompanied by lichenification, plasters of oil of cade, 10%, of yellow oxid of mercury or calomel, 2% to 5%, of pyrogallie acid, 1% to 3%, may be used. In seborrhœic eczema unaccompanied by oozing the same remedies useful

¹ Am. Jour. Med. Sci., Oct., 1898.

² Brit. Med. Jour., Sept. 10, 1898.

³ Ibid.

⁴ L'Eczema, Paris, 1898.

⁵ Gaz. hebdom. de Méd. et de Chir., Aug., 1898.

in psoriasis may be prescribed, such as strong glycerol of oil of cade, pyrogallie or salicylic acid in 5% to 10% strengths. One of the most useful among reducing agents is silver nitrate in 1% aqueous solution, which, while acting energetically, is not at all irritating. In **eczema of the scalp** the preliminary cleansing is of still more importance than in other regions; and when this has been completed a cap of caoutchouc should be worn at night. When the oozing has ceased, and in chronic forms, ointments of salicylic acid, pyrogallie acid, or oil of cade may be applied. In **eczema of the scrotum**, during the period of oozing, the patient should wear a caoutchouc suspensory bandage, which must be thoroughly cleansed 3 times a day, as well as the skin. Later, dressings with a solution of mercuric cyanid, 1 : 10,000, and finally painting with silver nitrate may be advised. In obstinate cases of eczema of the anus a 5% ointment of chrysarobin, as advised by Besnier, may be cautiously tried.

Hirschkron¹ has employed **naphtalan** successfully in 26 cases of eczema. In the acute oozing forms manifest improvement occurs in a few hours, the weeping diminishing markedly. In the chronic forms remarkable benefit follows its use, although not so promptly.

Aubert² thinks **picric acid** specially indicated in the acute and superficial forms of eczema. Its keratoplastic action is much less manifest in the chronic varieties accompanied by thickening. In acute eczema its use is followed by rapid subsidence of inflammation and diminution of weeping and itching. A solution containing 12 gm. in a liter of water is brushed over the affected area, and cloths wrung out of the solution are afterward applied, the dressing being renewed every 2 or 3 days.

Marfan³ regards the regulation of the diet as an essential part of the treatment of the seborrheic eczema of nurslings. Internally, every 15 days, he gives 0.01 gm. or 0.02 gm. calomel in divided doses. Locally a 1% solution of picric acid is to be applied.

Resorcin-alcohol in the Treatment of Seborrheic Eczema of the Face.—A. C. Frickenhaus⁴ recommends rubbing small patches of this disease once with a 25% solution, and then in a few days with a 10% solution. At night the skin may be anointed with a cold-cream ointment. In 8 days cure usually results. In stubborn cases of eczema of the nose the author has used a 50% solution with excellent effect. The application is also recommended for tinea versicolor. [Inasmuch as authors are not all in accord on this subject of so-called seborrheic eczema, the remedy suggested should be used at first with caution, lest it prove irritating.]

Eczema Palmare et Plantare.—W. Allan Jamieson⁵ has treated this condition successfully with Unna's oxidized pyrogallie acid. The treatment is begun by constant poulticing with starch poultices, with which are incorporated boric acid, the poultices being changed every 4 to 6 hours. Each time the poultices are changed the palms are rubbed with a rough, soft, dry cloth, which removes much of the sodden and unhealthy epidermis. In the course of 4 or 5 days the palms become soft, smooth, pliable, and of a pinkish hue. The poulticing

¹ Wien. med. Woch., Sept. 24, 1898.

² Thèse de Paris, No. 32, 1897.

³ Gaz. hebdom. de Méd. et de Chir., Dec. 11, 1898.

⁴ Monatsh. f. Prakt. Dermat., June 1, 1899.

⁵ Practitioner, Mar., 1899.

is then stopped, and the following ointment is rubbed thoroughly but sparingly in: R. *Acidi pyrogallici oxidati*, gr. 5–30; *lanolini*, 3ss; *ol. amygdalæ*, *aq. destil.*, *ad 5ij*. M. Jamieson considers the action of the oxidized pyrogallol quite remarkable in its power of restoring normal keratinization; and says that the results obtained have been permanent as far as his experience goes. Out of the 6 cases thus treated he has had only 1 that resisted the method in any way. He recommends that only the blandest soap be used after cure is effected; and for the soles of the feet he recommends a daily friction with a loofah and cold water.

Picric Acid in Eczema.—F. Radaeli¹ reports the results of a trial of picric acid in different forms of eczema in Pellizzari's clinic in Florence. The affected part was first freed from scabs, etc., the hair cut as short as possible, and the whole region thoroughly washed with boric-acid solution. When the part had been dried, applications of a saturated watery solution of picric acid were made with pledgets of cotton; then a compress wrung out of the same solution was applied, and over this was placed a layer of cotton-wool, the thickness of which was proportionate to the abundance of the secretion. The whole was kept in place by a bandage. The dressing was left on for 1 or 2 days. The author points out the special convenience of the picric-acid dressing in acute eczemas when there is much "weeping," as it does not require frequent changing. On the other hand, the remedy has the disadvantage that it causes great smarting in the parts to which it is applied. This, however, ceases completely in 10 to 15 minutes, giving place to a sense of relief, which is mainly due to the cessation of itching. The treatment is noted as one entirely satisfactory.

Chronic Eczema on the Hands.—Edlefsen² has found a successful mode of treatment of this disease. He orders a paint consisting of pure iodine, 0.1 part; potassium iodide, 0.25 part; glycerin, 12 parts. The paint is applied every evening, and the hands are enveloped in lint. The irritation is always relieved, and in 14 days the disease is generally cured. In the more obstinate cases boric-acid ointment is applied in the morning, and the iodine paint in the evening.

Salicylated Gelatin for Eczema.—Schwimmer³ gives the following: R. *Salicylic acid*, 10 parts; glycerin, 10 parts; gelatin, 30 parts; water, 30 parts. Dissolve by the aid of heat. He recommends this application for vesicular eczema.

Treatment of Eczema by Naphthalin.—Akhvlediani⁴ has treated 43 cases of acute and chronic eczema with naphthalin. If the eczema was moist he first applied a powder composed of 2 gr. of salicylic acid and 1 oz. each of zinc oxide and talcum. When the area had thoroughly dried he applied an ointment of lard containing 10% of naphthalin. The dressing was applied every morning after the parts had been cleansed with soap and hot water. Pains and pruritus disappeared in a week, and then the induration. After 2 or 3 weeks it was necessary to renew the bandages only every 2 or 3 days, and in 3 or 4 weeks the parts were entirely healed.

¹ Med. Age, April 10, 1899.

² Brit. Med. Jour., Nov. 1, 1898; Therap. Monats., Feb., 1898.

³ N. Y. Med. Jour., Jan. 14, 1899.

⁴ Med. News, Mar. 11, 1899.

Lysol in Pityriasis Versicolor.—A. L. Levy¹ has used lysol in pityriasis versicolor, with most gratifying results. The first 3 days he painted the affected parts with pure lysol once a day, and the following days the chest was thoroughly washed with a weak solution (0.5% to 1%) of it. The disease disappeared completely in 8 days. The applications caused no pain and no irritation.

Pityriasis Rubra.—Walter Smith² is quoted as follows: Pityriasis is characterized by: 1. A tendency quickly to become general. 2. An intense, angry redness of the skin, with slight infiltration and thickening. 3. Free scaly desquamation, but without crust-formation. 4. Tendency to relapse. 5. Resistance to treatment. 6. Decline of the general health, which finally may end in death. Historically the disease shows: (a) First period—the “Devergie-Hebra” phase. The disease is thought to be primary in origin. (b) Second period—in which Baxter first, in 1879, stated that the disease might be secondary as well as primary. (c) Third period—that of “revision.” It is not necessary to go as far as Schwimmer, who calls pityriasis rubra “Eine Verlegenheitsdiagnose,” though having to admit that between pityriasis rubra, acute general eczema, and certain cases of psoriasis no line can be drawn.

Pityriasis Rubra Pilaris; its Anatomy and Pathology.—A. Ravogli³ describes the case of a woman, 45 years old, Russian by birth, married, and the mother of 12 children. Aug. 4, 1898, while suffering from a slight general indisposition, she noticed pruritus and burning of the palms of the hands and soles of the feet. This was soon followed by a follicular eruption involving extremities, face, and body, and preferring the extensor surfaces over the flexor. The character of the early eruption was redness and undue prominence of the follicles of the skin, and was what he termed the primary or follicular type of the disease. Later, there was a tendency for the redness to diffuse over large areas; for the skin to become thickened, indurated, and covered with a furfuraceous desquamation; and for the folds and furrows of the skin to become unduly prominent. This stage he called the psoriatic type of the affection. The hairy surfaces became affected with pityriasis, and there was loss of hair from the scalp, eyebrows, eyelashes, axilla, pubes, and from the surface of the body in general. The palms of the hands and the soles of the feet became affected with a very extensive form of hyperkeratosis, and deep and painful rhagades or fissures formed over these areas. The eruption continued to spread, until at the present time nearly the entire surface of the body is affected with the psoriatic type of the eruption. Small surfaces which were latest involved still show a follicular type. Pruritus and excoriations were marked, and there were loss of weight and malaise. M. L. Heidingsfeld in the same paper gave a pathologic demonstration of the case, and also a demonstration of a case of *lichen ruber*, and showed essential differences between these diseases, refuting the opinion of Kaposi that these diseases are one and the same pathologic entity. He showed pityriasis rubra pilaris to be essentially a disease of the hair-follicles, with hyperkeratinization about the hairs and within the follicles; the follicles were often lifted from their beds and extruded upon the surface of the skin, covered with only the stratum

¹ Am. Medico-Surg. Bull., Oct. 25, 1898.

² Wien. med. Woch., Apr. 15, 1899.

³ Jour. Am. Med. Assoc., May 6, 1899.

corneum; cellular infiltration was limited to the subpapillary layer and mostly around the capillaries, the papillæ being entirely free. Elastic fibers were present in excess in the subpapillary layer of the corium. In lichen ruber the pathologic process is papular, there being a very extensive infiltration of usually 4 or 5 adjacent papillæ. The subpapillary layer was not infiltrated.

The Histopathology of Psoriasis.—Munro,¹ in order to eliminate all secondary changes, has studied the lesions of psoriasis in the earliest stages, and, as the result of the examination of 1500 sections taken from 6 untreated cases, he concludes that the disease is not due, as hitherto supposed, to some vice of formation of the corneous epidermis, the abnormal keratinization being an essentially secondary lesion. The primitive lesions of psoriasis are miliary abscesses of the epidermis, situated almost upon the surface of the corneous layer, and around these preformed abscesses the epidermic reaction produces a hyperkeratosis. Although long and carefully searched for, no specific microorganisms were found.

The Treatment of Ringworm.—Thomas² recommends his modification of Sabouraud's treatment for *tinea tonsurans*: 1. The entire scalp is painted with tincture of iodine and then carefully dried. By this each diseased patch is stained a darker brown than the healthy skin, enabling one to attack places otherwise invisible. A circle is drawn with a blue pencil around each ring, and the hair epilated for 1 cm. outside of it, the rest of the hair being cut short. 2. The patches are painted every day with the iodine until a certain amount of irritation of the skin is set up. The treatment is then suspended until the skin has regained its natural appearance and the hair begins to grow. The treatment is especially applicable to the more common variety of *tinea* caused by small spores.

Treatment of Ringworm of the Scalp.—H. Lyle³ adopted a new treatment for chronic cases of ringworm, which is especially useful to the country practitioner. The head is entirely shaved, and kept so. Each patch is scraped with a dermal curet, and then a solution of silver nitrate, a dram in an ounce of alcohol, is well rubbed in. This turns all the places black. The application is made twice a week, and after removing the black layer each time (which comes off easily) the underlying parasitic growth is scraped with the curet before repainting. The smarting after its use is slight and lasts only a short time. Oleate of mercury, 5% in oil, is then rubbed into the head night and morning. As the diseased areas become smaller the strength of the solution is increased to 2 drams to the ounce. The author is of the opinion that the solution, in addition to the destructive effect of the silver nitrate on organic matter, acts by depriving the growth of air.

A New Trichophyton.—Matruchot and Dassonville⁴ have isolated, cultivated, and reinoculated, both in the guinea-pig and in man, with positive results, a fungus similar to, but not identical with, that described by Sabouraud and Bodin. The observations were made to determine the nature of an epidemic attended with an herpetic eruption affecting some 40 horses of a cavalry regiment.

¹ Ann. de Derm. et de Syph., No. 11, 1898.

³ Internat. Med. Mag., Nov., 1898.

² Med. Age, Oct. 10, 1898.

⁴ Med. Rec., Nov. 5, 1898.

Botryomycosis, Human and Equine.—Louis Dor¹ has reached these conclusions: 1. The individuality and unity of the parasites are not so certain as is the individuality of the neoplasm histologically. 2. The tumor is a fibroadenoma, its origin being sudoriparous. To distinguish it from the true fibroadenoma, from which it differs absolutely, and to emphasize its inflammatory neoplastic character, it should be called **adenofibrosis**. 3. The castration-fungus of the horse is also an adenofibrosis developed in the epididymis. 4. The adjective botryomycotic is to be added in those cases in which the botryomyces is found.

An Eruption due to Exalgin.—M. G. Linossier² remarks the great rarity of cutaneous manifestations after ingestion of this drug. This patient, who could not take antipyrin because of the erythema which it caused, received about 4 gr. of exalgin for the relief of headache. An hour after a general erythema appeared. The following day the body was covered with round, brilliantly red, papular areas of considerable size. Upon the back of the hands and in the digital interspaces the elevations seemed to be ecchymotic. Later the epidermis was separated, and bullæ containing a colorless liquid appeared. Pressure upon the papular areas caused severe pain, although there was no marked itching. After the bullæ disappeared severe pain was felt at their site. There was also marked burning pain throughout the entire length of the alimentary canal, and erythematous patches were seen upon the gums. All these manifestations disappeared within 3 or 4 days.

Quinin Dermatoses.—Jacob Michaux³ recently exhibited to the Richmond Academy of Medicine and Surgery casts of palmar and plantar epithelium thrown off by a youth of 18 after 3 gr. of quinin sulphate given for a slight fever. Soon after, severe nervous symptoms and dermatitis resulted. In 10 days the skin of the body desquamated, as a rule, in small flakes. The skin of the hands and feet, however, came away in the casts exhibited. Similar phenomena had twice occurred from the use of quinin in the same patient.

Dermatitis Produced by Boric Acid.—R. B. Wild⁴ records a case of intoxication from the use of boric acid: The affected skin was of a bright-red color and covered with profuse scales of a slightly greasy character. The patches were irregular in shape, roughly symmetric in distribution, and very extensive in area. The hands, the forearms, the feet, and the legs below the knees were uniformly red, scaly, swollen, and pitted on pressure. Desquamation on the palms and soles occurred in large flakes. The scalp was red and scaly; the hair had almost entirely disappeared from the head, and was very thin on the face and pubes. The face presented only a few scaly papules. Digestion was disturbed, and there were marked debility and anemia, with loss of flesh.

Two Cases of Bullous Iodid Eruption.—Ohmann-Dumesnil⁵ reports the notes of 2 cases of this same form of disease, due to the potassium salt, the dose of the drug ingested being small, and the symptoms of intoxication appearing in a very short time. The uncovered portions were affected, especially the head, face, and neck. The kidneys and heart were affected. The contents of a punctured bleb placed on dry starch

¹ Lyon méd., Oct. 30, 1898.

² Am. Jour. Med. Sci., Aug., 1898.

³ Medicine, Oct., 1898.

⁴ Lancet, Jan. 7, 1899.

⁵ Medicine, Sept., 1898.

turned the latter immediately blue, thus giving the reaction of iodine. Both cases occurred [as is usual] in men, and one proved fatal. The prognosis is usually bad.

Chronic Primel Dermatitis.—E. Heuss¹ states that while cases of acute inflammation of the skin arising from contact with *Primula obconica* have been described, particularly of late years, instances of chronic inflammation resulting from this cause are rare. Characteristic of "primel dermatitis" is the sudden occurrence upon the hands and face of more or less intense inflammation, with itching, swelling, redness, vesiculation, and papulation, traceable to contact with *Primula obconica*. The plant was introduced into Switzerland from Japan in 1888. The poisonous properties are due to fine hairs on the under surface of the leaves, the microscope showing two varieties of hairs, one long and the other short. [In the United States, James C. White of Boston described the plant and its poisonous effect upon the skin, as far back as 1889, in *Garden and Forest*.]

Antipyrin Exanthems.—Lesser² asserts that the antipyrin exanthems are among the most prevalent of those due to drugs. The reason is that antipyrin is not only prescribed by the physician, but is procured and used extensively by the laity. The characteristics are: 1. The appearance of only a few spots, the points of predilection being around the body-openings and localities liable to pressure; and the effects upon the extremities, hands, and toes. 2. The strong pigmentation and their long persistence. 3. Their occasional chilblain-like infiltration. 4. The outbreaks in the same spots every time antipyrin is taken. In addition to these, other parts may be also attacked. There are violent burning and itching, which come on soon after the use of the drug.

Nonsurgical Treatment of Furuncles.—Bulkley³ writes as follows: The objects aimed at by the treatment are: 1. Soothing and protecting an inflamed area. 2. Exclusion of air. 3. A slight antiseptic action. Incision is not necessary, but over the lesion is put a layer of absorbent cotton, on which is spread the following ointment: *R.* *Acidi carbolic*, gr. v-x; *ext. ergotæ*, flʒj-ij; *pulv. amyli*, ʒij; *zinci oxidi*, ʒij; *ung. aquæ rosæ*, ʒj.—*M.* This dressing is renewed at the end of 12 hours, and treatment continued during the process of healing.

Yeast in the Treatment of Furunculosis.—Turner⁴ states that Brocq of Paris has tried yeast in the treatment of furunculosis, and has found it most efficacious. This treatment had already been mentioned by Follin, Gingeot, and Debouzy. Brocq began trying it in 1894, and has used it on about 50 patients suffering from diverse complaints, such as carbuncles, boils, and infectious or inflammatory diseases of the skin. According to Turner, Brocq has long been subject to periodic attacks of carbuncle, occurring every 4 or 5 months. Other drugs failing to give relief he tried yeast, and as a result the pains diminished rapidly after the third day, all edema and inflammation being checked in their progress, and in some cases suppuration being prevented. Brocq has described several other cases in which surprising results were obtained most rapidly and there was no recurrence of the disorder. He uses fresh beer-yeast. [*Bakers' yeast* is not of much value.] The full

¹ Monatsh. f. prakt. Dermat., July 1, 1899.

² Med. Rec., Apr. 24, 1898.

³ N. Am. Pract., Oct., 1898.

⁴ Phila. Med. Jour., Apr. 29, 1899.

dose is, on an average, 3 teaspoonfuls daily; but it may be increased to 9 or 10 in some cases. The administration of the yeast may cause indigestion, and in rare cases diarrhea. These symptoms are not very tenacious, and by using this medicament discreetly no untoward results need be expected. Brocq has not found it necessary to use complicated external applications. The yeast should be quite fresh, and changed every day in summer and every 2 days in winter.

Dermatitis Herpetiformis Followed by Cicatrices and Epidermic Cysts.—Brocq¹ reports a case of dermatitis herpetiformis, with erythematous, vesicular, and bullous lesions, lasting a year and a half, in which the parts affected gradually took on a cicatricial aspect, and small epidermic cysts appeared similar to those observed in the affection described by Hallopeau as congenital bullous dermatitis with epidermic cysts. The treatment was by static electricity, which seemed to exert a general tonic effect and to allay the itching. In another case of the same disease static electricity relieved the pruritus.

Value of Arsenic in Dermatitis Herpetiformis.—A physician² reports his experience upon his own person, and points out the marked amelioration of the disease during attacks of malarial fever derived from the use of arsenic in full doses.

Pemphigus Vegetans.—Mracek³ describes a case of pemphigus vegetans in a woman, 68 years old, who noticed the first symptoms of the disease 7½ years before. In most cases of this disease (as described in Neumann's first publication) the patients die about 9 months after its first appearance. Mracek's case ran a chronic course. In the beginning she was in a condition of marasmus, which improved so much that during the following 3 years she was completely free from the eruption. The disease was localized at the back of the neck, the axillary, the genito-crural, and lower abdominal regions, and around the anus. Later in the course of the disease there appeared furrows, which were covered with wart-like vegetations somewhat like those in acanthosis nigricans, with considerable dark pigmentation. This pigmentation could be reduced, and even disappeared, under prolonged treatment with arsenic.

Acute Pemphigus Neonatorum.—Bernstein⁴ reports 5 cases of a bullous eruption, all occurring in the same family. The first case was a 3-weeks-old infant; later 3 other children, aged respectively 3, 4, and 7 years, together with the mother, were attacked. Syphilis, impetigo contagiosa, urticaria bullosa, and varicella were all considered in the diagnosis, and excluded for what seemed to the author sufficient reasons. The eruption upon the infant was regarded as a pemphigus of the newborn, which was transmitted later by contagion to other members of the family. [We are by no means convinced that the diagnosis of impetigo contagiosa can be excluded in these cases.]

Pemphigus Foliaceus with Osteomalacia.—Hallopeau and Costenseau⁵ present a woman, 46 years old, in whom osteomalacia appeared 8 years after the beginning of a typical pemphigus foliaceus. The reporters are of the opinion that the coexistence of these 2 affections in

¹ Am. Jour. Med. Sci., Jan., 1899.

² Brit. Jour. of Derm., July, 1899.

³ Wien. klin. Rundschau, May 22, 1898.

⁴ Monatsh. f. prakt. Dermat., Band 28, No. 1.

⁵ Ann. de Derm. et de Syph., No. 11, 1898.

this case was not simply a coincidence, but was probably due to resorption of the collagenous substance of the bones under the influence of the profound disturbance which the constant loss of organic materials by the surface of the skin brings about in the blood, setting free the phosphates which are normally combined with them.

Acne Rosacea; its Treatment.—G. W. Wende¹ says: When the indications demand a quickened circulation, **external galvanism** affords a better means of stimulation than drugs topically applied. In addition to its local effect, it relieves the reflexes, to which the disease frequently is due. In cases in which hypertrophic changes have followed—the bloodvessels being tortuous and largely dilated—electrolysis in addition to galvanism should be employed. With ordinary care the scars will be imperceptible.

Bloebaum² recommends the use of a **galvanoincandescent needle** of his own construction. The tissues are anesthetized by the method of Schleich. The needle is used for "puncture and knife-like actual cautery." This, done at intervals of a few days, will remove the unsightly masses, and the scars resulting are scarcely visible.

Chambers³ advises that the **diet** be most carefully regulated and that constipation be treated. **Ergot** in certain cases (when of women) is most useful. **Ichthyol** also is of value. The external treatment depends upon which of the 3 forms of rosacea the particular case may be: 1. Hypertrophic varieties, if due to connective-tissue increase, require surgical interference, since topical applications are of slight avail. Electrolysis is suggested. 2. Nonhypertrophic cases indicate "antiseptic keratoplastic" remedies. Of these are resorcin, sulphur, pyrogallol, etc., used in ointment at bedtime. 3. In the seborrheic variety the treatment is much like that of the nonhypertrophic. Suggested: Sulphur, 10 parts; resorcin, 10–25 parts. The latter in amount suited to the irritability of the skin. Rubbing the part with green soap and water is effective, though disagreeable; it should be continued 2 weeks, then followed by milder applications of reducing agents.

Acne Keratosa.—H. Radcliffe-Crocker⁴ reports 4 cases, all occurring in females. Finger-nail-sized, well-defined, excoriated patches covered with hard, blood-stained crusts situated on the cheeks and chin, especially near the angles of the mouth, existed in all the cases. They began as a red, firm, tender lump, on which a pustule usually formed and dried into a crust. On removing the crust soft or horny conical-like plugs about $\frac{1}{12}$ in. long remained, which gave rise to great irritation. The lesions were usually symmetric. When the plugs were extracted the lesions healed, leaving scars. The plugs reappeared, keeping up the disease for years. The horny plugs were composed of epithelial horny cells, with a few prickle cells and cell-nests.

Acne Varioliformis Capillitii.—Popper⁵ reports the following case: A man, 30 years old, suffered for 2 years from a painful affection of the scalp. Upon inspection, flat, lentil-sized, bluish-red, painful nodules were to be seen scattered over the scalp, and between these were small pustules and flat, umbilicated crusts. Very large comedones were

¹ Buffalo Med. Jour., Nov., 1898.

² New Orl. M. and S. Jour., Nov., 1898.

³ Canad. Pract., Nov., 1898.

⁴ Jour. Cutan. and Gen.-Urin. Dis., May, 1899.

⁵ Am. Jour. Med. Sci., Mar., 1899.

also present. After healing of the affected places, deeply situated, unsightly scars remained. The contents of the pustules were frequently examined for microorganisms, but always with negative results. Treatment consisted in washings with spiritus saponis kalini and applications of a white-precipitate ointment, with improvement after 10 or 15 days.

Internal Use of Ichthyol in Acne.—Tessner¹ claims that ichthyol has a good effect in cases of acne which is accompanied by constipation. Patients improve rapidly under its use. The remedy, although it produces at first some unpleasant belching, soon becomes well tolerated, and, without causing diarrhea, it regulates the bowels and improves digestion. It is prescribed in pills or capsules or in concentrated solution in doses of from 5 to 8 gr. 3 times daily, preferably after meals. A tasteless and odorless form of ichthyol has recently been introduced under the name of ichthalbin, which may be used for the same purposes in doses of 1 dram.

Isolated Vesicles of Herpes Zoster.—MM. Jeauselme and Leredde² point out that notwithstanding the common opinion as to the strict delimitation of the vesicles of zoster over a determined nerve-territory, they find in a large number of subjects vesicles disseminated over the entire tegumentary surface. These vesicles resemble those proper to zona; and, if their evolution is studied, it is found that they belong properly to the zoster, and are not pustules of self-inoculation. All attempts to reproduce such vesicles by inoculation proved negative. The authors consider that this fact coincides with the hypothesis of a zoster fever upheld by Landouzy. Two of their patients had fever with adenopathies and albuminuria.

Impetigo Herpetiformis.—H. Hallopeau³ considers at length the nature of this disease, and in conclusion states that the cause is "some infectious agent which penetrates the integument and there multiplies." While the precise microbe is as yet undetermined, evidence points that it is aerobic. Whatever it may be, the beginning by suppuration, the febrile reaction, with chill, all indicate the purulent nature. It differentiates itself from the common infection by the fact that there is no complicating visceral infarction. The name is objected to and a better one suggested—"purulent integumentary infection." Finally, it is noted that there may be absence of herpetiformity.

Infectious Multiple Gangrene of the Skin.—M. B. Hartzell⁴ reports the case of a farmer's wife, aged 46 years, who ran an unclean meat-hook under the nail of the third finger of the right hand 4 years previously. Shortly after this injury a painful, spreading ulcer formed in this situation, which was followed by a second just above the right internal malleolus, the disease spreading thence to the arms, legs, chin, shoulders, and upper part of the chest. Since the appearance of the first ulcer the patient had never been free from the malady. The lesions began either as small, pale-red papules, which within a very few hours were replaced by pin-head-sized, flaccid vesicles capped by a small black crust; or they were vesicular from the beginning, with a minute black or brown crust upon the summit. They attained the size of a large pea within 24 hours. Unless excised or destroyed in some manner, they con-

¹ St. Paul Med. Jour., Feb., 1899.

² N. Y. Med. Jour., Aug. 20, 1898.

³ Bull. de l'Acad. de Méd., Oct. 4, 1898.

⁴ Am. Jour. Med. Sci., vol. cxvi., p. 43.

PLATE 6.



Lichen planus with marked pigmentation resembling syphilis, followed by sudden death (Fordyce, *Journal of Cutaneous and Genito-Urinary Diseases*, Feb., 1899).

tinued to enlarge in all directions, the borders being very firm to the touch, while the center was occupied by a constantly growing, dry, gangrenous mass, which was in time loosened by suppuration, evidently of secondary origin, occurring beneath it, exposing a round, deeply excavated, sharply circumscribed ulcer, with elevated, firm borders, spreading in depth and circumference, the bottom covered by a grayish or black slough. After healing, a white, slightly depressed scar took the place of the ulcer. Rapid healing followed a thorough and complete excision of the lesion. Microscopically, the disease involved the entire thickness of the skin, forming in the center a homogeneous mass, and cavities upon the sides, with degenerating epithelium and cellular debris. In the lowest layers of the mucous layer and in the papillary and subpapillary portions of the corium great numbers of bacilli were found, scattered irregularly, resembling the *Bacillus tuberculosis*. The ordinary *Staphylococcus pyogenes aureus* was also present in large numbers.

Hydroa Vacciniforme.—J. C. White¹ reports several cases of this rare affection. After discussing the features at length, the pustulation and subsequent scarring, he asks whether these cases should be included in that other peculiar disease, dermatitis multiformis; or whether they were of a protean and exaggerated nature, atypical in relation to seat and to season, and did not belong to the true hydroa vacciniforme.

Universal Lichen Planus Followed by Sudden Death.—J. A. Fordyce² reports a case occurring in a woman, aged 60. (See Plate 6.) There existed severe mental strain, with mental aberration; also alcoholism. After improvement under arsenic until the eruption almost had gone, one day, while leaving her bed, she fell down unconscious and died soon after. At autopsy the heart showed dilatation and some atrophy of the muscle.

HYPERTROPHIES AND ATROPHIES.

The Contagiousness of Alopecia Areata.—Blaschko³ presented a boy before the Berlin Medical Society, who was 1 of 8, belonging to the same school, attacked by alopecia areata. These boys were playmates and lived near together. Other diseases resembling alopecia areata were apparently positively excluded.

Kober⁴ reports a similar epidemic occurring in a gymnasium. Eight boys, between the ages of 12 and 13, 6 in one class and 2 in another, were attacked by typical alopecia areata within a short time. It is noteworthy that the 6 in one class occupied the same bench.

Plonski⁵ likewise reports 2 cases supporting the theory of contagion. A 9-years-old boy presented round, hairless areas upon the scalp, the skin being normal in color, smooth, and without scales. Three weeks later a 6-years-old sister was found to have similar bald patches. In the second observation 2 sisters, the one 10, the other 6 years old, presented patches of alopecia areata, lasting respectively 1 year and 6 months.

Treatment of Alopecia Areata.—McGowan⁶ finds trikresol a useful agent in the treatment of alopecia areata. It is applied pure to

¹ Jour. Cutan. and Gen.-Urin. Dis., Nov., 1898.

² Ibid., Feb., 1899.

³ Berlin. klin. Woch., No. 5, 1898.

⁴ Ibid., No. 15, 1898.

⁵ Derm. Zeit., Band 5, Heft 3.

⁶ Jour. Cutan. and Gen.-Urin. Dis., May, 1899.

the scalp, and in 50% alcoholic solution to the face. It must be well rubbed into the bald areas and into the roots of the hairs for $\frac{1}{2}$ in. around them. The applications cause moderate burning, which, however, usually ceases in a few minutes. The skin at first turns white; but after a few hours this whiteness is followed by hyperemia. Upon the scalp a slight exudation of serum occurs; upon the face vesication sometimes takes place. At the end of 24 hours a dry, brownish scale forms, which falls in from 4 to 10 days; another application of the remedy may then be made. It is considered superior to carbolic acid (which causes irritation and pain), and the author's good results in a number of cases warrant him in recommending the drug. From the histories of the cases reported we learn that the average time of cure was $2\frac{1}{2}$ months, irrespective of the age of the patients. The drug was rubbed into the scalp about once every fifth day.

Sprangenthal¹ has found the following application useful: \mathcal{R} . Mercuric chlorid, 20 gr.; glycerini, 4 drams; eau de Cologne, 18 oz.— \mathcal{M} . Under treatment with this lotion the hair was fully restored in about 1 year after the beginning of the disease.

Treatment of Baldness.—Barie² has found that rubbing the scalp nightly with the following lotion will stop falling of the hair: \mathcal{R} . Hydrochloric acid, 75 drops; alcohol, 2250 drops.— \mathcal{M} .

The Relationship of Darier's Disease to Ichthyosis.—E. Doctor,³ after a clinical and microscopic study of 2 recent cases of Darier's disease, concludes that the differences between this affection and ichthyosis are not sufficient to justify the setting up of a new type of disease. Darier's disease is a hyperkeratosis connected with the hair-follicles and the ducts of the sweat-glands. Usually there is also parakeratosis. It is a variety of ichthyosis, differing from the common form clinically chiefly through its localization and the presence of the so-called Darier nodules; microscopically, by the proliferation of the papillæ and the rete mucosum.

Atrophying Hyperkeratosis.—Ducrey and Respighi⁴ prefer to call the affection, first described by Mibelli under the name porokeratosis; atrophying hyperkeratosis. From a new and extensive clinical and histologic study of this singular disease they conclude that it may occur upon the mucous membranes as well as upon the skin; and that, by reason of its special and constant clinical and anatomic characters, it must be considered a particular morbid entity, not to be confounded with the lichen of Wilson, with which dermatosis it seems to be most nearly related, nor ranged in the group of ichthyoses.

Recent Notes on Scleroderma.—H. F. Lawrence⁵ reports a case of scleroderma diffusum following severe shock to the central nervous system in a woman, aged 48. In 2 months the first patches developed, spreading until the head, hands, and feet alone were free. The general health was much impaired; locally, appeared the characteristic board-like hardness; sensation seemed but slightly affected. Treatment: rest

¹ Buffalo Med. Jour., Nov., 1898.

² Cron. med., Oct. 3, 1898; N. Y. Med. Jour., Jan. 14, 1899.

³ Arch. f. Derm. u. Syph., Band 46, Heft 3.

⁴ Ann. de Derm. et de Syph., Nos. 7, 8, 9, 1898.

⁵ Intercol. Med. Jour. Austral., July 20, 1898.

in bed, warmth, and nourishing food; locally, galvanism and massage with lanolin; internally, thyroid extract, malt extract, iron, and strychnin. Improvement was marked. The skin so affected is very irritable and liable to injury from friction of the clothes, the damage to the tissue occurring as painless, unhealing ulcers. The morbid process apparently involves an hypertrophy of the preexisting collagenous bundles, causing pressure-atrophy of the bloodvessels and sweat-glands, the condition of the function of the latter being a valuable point in prognosis.

Leredde and Thomas¹ report the necropsy on the case of a male, aged 40, syphilitic, who resisted all treatment, became much emaciated, and died. The only macroscopic lesions, apart from those of the skin, were found in the vascular system: the aorta was exceedingly atheromatous and the arteries of the limbs absolutely calcified; the nerves histologically presented nothing abnormal. The pathogenesis is discussed. Méry lays stress on the arteries, which, he thinks, infectious; some look to lesions in the thyroid; others, as Brissaud, regard the nervous system important. The coexistence of hemiatrophia is cited in evidence. Finally, the possibility of toxic origin is admitted.

Infectious diseases preceding scleroderma are often noted,² as rheumatism, typhoid fever, erysipelas, diphtheria, and syphilis. May not the dermatosclerosis be due to some toxic substance affecting the connective tissue, as the toxins of tuberculosis are supposed to cause the "cutaneous tuberculides"?

Uhlenhuth³ discusses scleroderma in connection with a case in a violinist, aged 41. Scleroderma occurs once in 19,000 of all diseases, or once in 1800 of skin-affections; 65% are women. The affection is divided into (1) morphea, (2) scleroderma diffusum, and (3) sclerodactyl; and again into acute and chronic. The first stage is the edematous; with this may appear pigmentation and paresthesia; the urine contains sugar. Pathologically, the pigmentation is interesting, as being like the "bronzed skin" of Addison's disease. The theories of causation are various: Hereditary tendency, trophoneurosis, the infection theory (Spadaro and Hoppe-Seyler), and that of Singer, who classes scleroderma with myxedema and exophthalmic goiter. In treatment, next to nutritious diet, iron and codliver oil in large doses, potassium iodid and hot baths, with the use of ointments (Mosler), are much recommended. Calcium sulfoethylthiol is mentioned, and salol for those who cannot afford the baths.

L. Stevens⁴ reports an autopsy on a case concerning which thorough observations during life are on record. He notes that in the spinal cord the gray matter on the affected side was diminished, the ganglion-cells smaller and less numerous, and the neuroglia more dense than on the other side. Throughout the cord, medulla, and pons the arteries were surrounded by spaces, empty or filled with a homogeneous substance, the spaces having well-defined margins. The nerve-fibers from the cervical and lumbar plexuses showed marked parenchymatous degeneration; the neuritis is regarded as secondary, but of this a reasonable doubt could be entertained.

¹ Arch. de Méd. expér. et d'Anat. path., Sept., 1898.

³ Berlin. klin. Woch., Mar. 6, 1899.

² Sem. méd., Sept., 1898.

⁴ Lancet, Jan. 7, 1899.

Osler¹ quotes cases of scleroderma in which the thyroid is fibrous and reduced in size.

Depigmentation.—J. Fryding-Lund² reports an interesting series of experiments. He says that the successful process must be unaccompanied by tissue-destruction. The agents, naturally, are those substances having a bleaching or oxidizing action; these he found useful in weak solution. Sodium peroxid (4%) requires 1 hour; calcium chlorate (5%), 3 hours; liquor sod. hypochlorat. (undilut.), 5–6 hours; hydrogen peroxid, more than 24 hours. The work is given in detail.

NEOPLASMS (NEW FORMATIONS).

Multiple Cutaneous Lupus Following Measles.—Adamson³ reports a case of verrucose lupus, with multiple lesions, occurring in a boy 3 years of age, in which the eruption was said to have appeared first during an attack of measles when the patient was 2 years of age. The lesions appeared simultaneously; and since the first eruption there had been no new lesions, although the old ones had grown larger. The eruption consisted of raised, purplish-brown patches, from $\frac{1}{10}$ to $\frac{1}{4}$ in. in diameter. Many were scaly, and those upon the hands were warty. They were most abundant upon the right elbow, the right wrist and hand, on both knees, and on the right ankle and foot. Later the patient was treated for postpharyngeal abscess and hip-joint disease. There was no family history of tuberculosis.

Local Treatment of Lupus with Creasote.—Protopopow⁴ reports 3 cases of lupus greatly improved by the use of creasote. Before making the applications the diseased patches are thoroughly scarified. The disagreeable odor and the somnolence caused by the creasote are the chief disadvantages of this method.

Unna⁵ makes use of the following ointment in small superficial patches of lupus: Acid. salicylic., antimon. chlorid., $\bar{a}\bar{a}$ 2 gm.; creasoti, ext. cannabis ind., $\bar{a}\bar{a}$ 4 gm.; lanolini, 8 gm.—M. This is spread upon the patches and covered with zinc-oxid adhesive plaster. The ointment is renewed every 24 or 48 hours. The nodules subside very rapidly under this treatment, healthy granulations taking their place.

Treatment of Tuberculous Processes with Pyrogallol.—Veiel⁶ regards the use of pyrogallol in tuberculous affections of the skin as superior to any surgical treatment, the only disadvantage attending this method of treatment being its long duration. The diseased parts are first destroyed by 10% pyrogallol vaselin, spread upon lint, and applied for 3 to 5 days. The wound thus made is treated by applications of $\frac{1}{2}$ % to 2% vaselin, this ointment being strong enough to destroy lupous tissue without preventing the formation of sound granulations.

Injection of Calomel in the Treatment of Lupus.—Du Castel⁷ treated 2 patients with lupus vulgaris by means of calomel injections. A process resembling somewhat that seen after injections of tuberculin was noticed in the diseased areas after injection of the calomel. In

¹ Pacific Med. Jour., Sept., 1898.

³ Brit. Jour. of Derm., Jan., 1899.

⁵ Sem. méd., Dec. 21, 1898.

² Monatsh. f. prakt. Dermat., May 1, 1899.

⁴ Dermat. Centralbl., Feb., 1899.

⁶ Arch. f. Derm. u. Syph., Band 44.

⁷ Ann. de Derm. et de Syph., No. 7, 1898.

the first patient so treated a slight improvement was noticed, but no appreciable effect followed in the second. After 6 months' study of this method Du Castel concludes that injections of calomel are only an adjunct to the treatment of lupus, and should be associated with surgical measures. Berntheim¹ reports a case of lupus, which had been unsuccessfully treated by caustics, scarifications, curetting, and tuberculin, cured by injections of calomel. A 10% emulsion in olive oil was used at intervals of 8 days, 12 minims being given at each injection. After 8 injections there was a decided diminution of the hyperemia; and a few weeks later all ulcerations were healed, and a cure was obtained in 3½ months.

Potassium Permanganate in Lupus.—Kaczanowski² has had successful results in 34 cases of lupus from dusting the surface with potassium permanganate, the crusts having first been removed with vaselin, warm water, and soap. A single application is sufficient; the crust formed falls off in a fortnight and the patch heals. The applications are painful, but not more so than other caustic remedies, and are not intolerable.

Radical Excision and Transplantation in Lupus.—Schultze³ asserts that this method gives most favorable results. During 8 years, out of 57 cases so treated, in but 2 has there been a serious return: 8 recurred at the margin, and 2 in the center; but in these excision and suture led to ultimate recovery. The prognosis rests largely on the situation of the lesion and the measure of involvement of tissue.

Dilute Caustic Potash in Lupus.—This dressing has been found so effective by Unna⁴ that he recommends it as superior to all others used to date. It never smarts, and the beneficial action is notable in many cases.

Tuberculosis Verrucosa Cutis.—Comby⁵ reports cases of this disease, which was first recognized by Riehl and Paltauf. The warts are situated on a red base surrounded by a zone of erythema. On squeezing, a little sanious pus exudes from the center, which is deeply fissured. The lesions are most frequent on the hands. The actual cautery, preceded by scraping, if the individual lesions are large, is the treatment recommended.

Keloid and Intractable Patches of Chronic Inflammation of the Skin Treated by Scarification.—H. Lawrence⁶ reports the success of this treatment when excision of a keloid (Alibert) had twice failed. The blades of the scarifier should be at least $\frac{1}{16}$ in. apart; otherwise pieces of the skin will be torn away by the cross-incisions. After thorough "mince-meating" the tissues, involving the bloodvessels, use hot fomentations of boric acid, dust with iodoform, and dress with zinc-glycogelatin. Follow by continuous pressure. Patches of chronic eczema, lupus erythematosus (edematous variety), patches of chronic traumatic dermatitis, and intractable chronic lichen planus have been cured by this method.

Liomyoma Cutis.—C. J. White⁷ records a case of this rare disease

¹ Münch. med. Woch., No. 46, 1898.

² Med. Sentinel, Sept., 1898.

³ Wien. med. Woch., Nov. 5, 1898.

⁴ Jour. Am. Med. Assoc., Sept. 17, 1898.

⁵ Arch. de Méd. des Enfants, Dec., 1898.

⁶ Brit. Med. Jour., Jan. 14, 1899.

⁷ Jour. Cutan. and Gen.-Urin. Dis., June, 1899.

(see Fig. 2) occurring on the face (particularly the region of the lower jaw and neck) of a man, an American by birth, aged 45. The disease consists of pinhead- and pea-sized, pinkish, glistening, translucent, firm, discrete, painful tumors, the pain being always marked when the lesions were exposed to pressure and also to a cold atmosphere. The tumor, under the microscope, showed a growth of muscular tissue which had replaced almost entirely the usual constituents of the normal corium. There was also hyperplasia of the bloodvessels; and, moreover, a secondary process in the form of degeneration was observed in the substance of

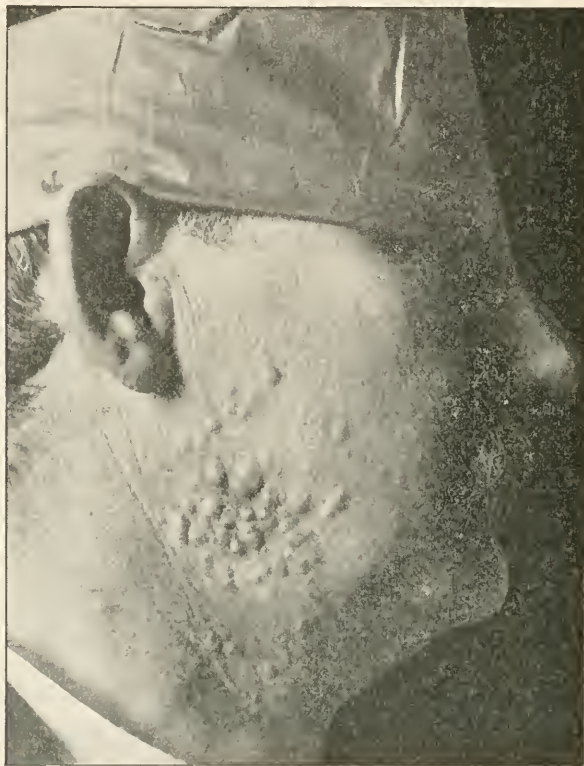


FIG. 2.—Liomyoma of the side of the face (Jour. Cutan. and Gen.-Urin. Dis., June, 1899).

the tumor. [While this form of neoplasm usually persists, occasionally it undergoes spontaneous involution, as in some of Jadassohn's cases.]

The Treatment of Lupus Erythematosus.—Hans Hebra¹ has obtained very good results from the external application of **alcohol** to the affected areas by means of cotton. The alcohol should be applied repeatedly without rubbing, and allowed to evaporate. These applications should be made several times a day, the more frequently the better. The cold produced by the evaporation of the alcohol, and the abstraction of water, contract the bloodvessels, causing the patches to become less visible and the elevation and edema to disappear. The use of soap

¹ Wien. med. Woch., pp. 13-15, 1899.

should be avoided during the treatment. Hutchinson¹ reports a case of lupus erythematosus apparently cured by the application of pure **carbolic acid**. The acid was painted over the patches once or twice a week, while an ointment of boric acid—20 grains to the ounce—was applied daily. In addition to this local treatment the patient was given minim doses of Pearson's solution of arsenic.

Spontaneous Cure of Lupus after Operation for Salpingitis.—Seeligman² reports this case in a woman, aged 40. Her father had died of tuberculosis, and the patient had an extensive lupus of the face and scalp. Shortly after the operation the ulcers were replaced by smooth cicatricial tissue without local treatment.

Tuberculosis Cutis Propria.—E. Bloch³ makes a sharp distinction between primary tubercular ulcerations of the skin and other forms of tubercular disease, as lupus vulgaris and serofuloderma. The first are rare; the latter common. The reporter records a case of tubercular ulceration of the vulva accompanied with advanced tuberculosis of the lungs and intestines. The ulcers on the skin were extensive, irregular, superficial, pale, and studded with grayish nodules.

Case of Acute Disseminated Miliary Tuberculosis of the Skin.—Pelagatti⁴ records a case occurring in a child 2 years old, the cutaneous disease appearing after measles, along with acute tuberculosis of the lungs and intestines. The eruption consisted of hemispherical papules the size of hemp-seeds, or rather larger, of a yellowish-red color, without surrounding hyperemia, sharply defined from the earthy-white skin on which they were seated. The center of each papule was rough and scaly. There was no grouping; no itching. Some papules disappeared, leaving no trace; others increased in size, forming nodules with scales adherent to their summits. On removing the scale a concavity remained; a few scars were left, like those of variola. The skin-lesions consisted of typical tuberculous formations with giant cells and large numbers of tubercle-bacilli.

Primary Tuberculosis of the Skin.—E. Schwimmer,⁵ in a very conservative paper, considers the subject in several of its phases. The development of the modern standpoint is given, since he holds that forms the key to the medical science of today. The effects of the tuberculous and the syphilitic virus are contrasted. "We denote as tuberculous disease of the skin those processes in which the following 2 conditions are met: 1. The presence of tubercle-bacilli. 2. Positive results following inoculation in previously healthy tissue. Four such diseases exist: (1) Skin-tubercle and tuberculous ulcer, (2) lupus vulgaris, (3) serofuloderma, and (4) tuberculosis verrucosa cutis." Each of these 4 is subjected to a careful discussion as to nature and interrelation from a clinical and a pathologic point of view. Under the first are noted the development and subsequent breaking down with ulceration. "The duration of the nodules, the appearance of similar ones, their persistence, and the softening which follows, producing destruction of the tissue, make the picture pathognomonic." The miliary nodules at the base of the ulcer, and the elevations covered

¹ Arch. of Surg., Jan., 1898.

² Med. Bull., Apr., 1899.

³ Dermat. Centralbl., Jan., 1899.

⁴ Giorn. Ital. delle Mal. Ven. e della Pelle, 1898; Brit. Jour. of Derm., July, 1899.

⁵ Wien. med. Woch., Nos. 36-38, 1898.

with epidermis in the neighborhood of the lesion, he claims typical of this disease in his experience. True tuberculous ulcer is of rarest occurrence. Skin-tubercle appears in many forms, the diagnosis of which, previously very difficult, now is reasonably certain. Experimental inoculation gives the most sure test, since the bacilli are absent more often than would be expected. It seems probable that all these processes are due more to the toxin than to the germs themselves; in doubtful cases the conjunction of general tuberculosis with a local manifestation is significant. Lupus, whose nature was once doubtful, since the work of Leloir must be considered tubercular. Those parts of the body which are unclothed appear most often affected—the face particularly; the openings of the sebaceous and sweat-glands afford lodgement for the infection. Unna recently asserted that the lesions find their origin in the vessels of the locality, in the connective tissue; this is yet to be proved. Lupus is essentially a local disease, infectious beyond doubt, but it is questionable if this is through the bacilli. Further research is to be desired in this direction. Scrofuloderma belongs usually to the secondary forms of tuberculosis. It does occur synchronously with other skin-affections, and in so far is germane to this article. This form differs from the 2 preceding in that, while they are cutaneous, this is distinctly subcutaneous. The skin, at first intact, allows us, more by palpation than by inspection, to observe the nodules, which gradually increase in size, become bluish, soften, and suppurate. It appears often as a diffuse infiltration of the skin, in numerous places having small, lupus-like (yet not true lupus) formations. The scrofulous ulcer is characterized by its sharp, dark-red, punched-out edges; by the watery pus, and the slightly protruding base. Tuberculosis verrucosa cutis, but recently known as such to pathologists, is the “lupus sclereux” of the French. This disease ranks between lupus and true skin-tuberculosis. It is held to have the following characteristics: 1. The appearance of nodules with wart-like layers and having a tendency to spread in the periphery. 2. Autoinoculation. 3. Presence of tubercle-bacilli. Out of 8899 cases of all skin-diseases seen in 3 years he finds but 10 of this affection; one ending fatally in tuberculosis of the lung. Histologically the disease is characteristic. The corium shows tuberculous nodules of the usual type, and there occurs also a small-cell infiltration of greater extension; bacilli are not always found. This variety is held less infectious than the preceding, since from its locality, usually the extremity, it is more easily treated and more successfully. Finally, several other diseases are mentioned whose possible tuberculous nature is admitted: these are lichen, acne scrofulosorum, and erythema tuberculatum. The relation of local and general tuberculosis is discussed, and their connection with the synchronous or subsequent occurrence of pityriasis rubra, impetigo herpetiformis, and pemphigus.

The Cutaneous Paratuberculoses.—J. C. Johnston¹ concludes from his studies that there is a class of cutaneous diseases analogous to the parasymphilides which may be designated paratuberculoses. They are not in themselves tuberculous, but develop and flourish in a tuberculous soil. They may be divided into 3 groups: scrofuloderms, tuberculides, and dyschromia. The scrofuloderms are pure pyodermias, by which characteristic they are separated from the tuberculides, which are only

¹ Jour. Cutan. and Gen.-Urin. Dis., July, 1899.

accidentally pustular. The tuberculides include a variety of affections, ranging from *erysipelas perstans* to *lichen scrofulosorum*, which are toxidermias. The points upon which the right of a disease to admission to this category rests are: absence of tubercle-bacilli, proved by microscopic examination and inoculation; occurrence in scrofulous or frankly tuberculous patients in more than a bare majority of cases; a pathologic anatomy at least comparable to that recognized for tuberculosis, and, finally, if possible, as in the case of *lichen scrofulosorum*, experimental production of the disease by injections of tuberculin.

Contribution to the Study of Blastomycetic Dermatitis.—

Hyde, Hektoen, and Bevan¹ report a case of this rare manifestation occurring upon the back of the hand, and conclude that a sufficient number of cases have been recorded to prove that blastomycetic dermatitis is a distinct disease, due solely to the invasion of the skin by one of the plant-forms of the yeast family; that this affection is one which bears a close resemblance to certain forms of tuberculous infection of the skin, and that while the larger number of cases suggesting in clinical aspect the tuberculous nature of the process will, as heretofore, be demonstrated to be such only, yet in a small proportion of such cases it is probable that blastomycetic invasion may have occurred. The internal use of potassium iodid is worthy of trial in all cases of blastomycetic disease of the skin.

Blastodermic Dermatitis.—Robert Hessler² states that the yeasts as disease-producers have recently gained prominence. T. C. Gilchrist was the first writer to report cases in this country. A healthy man was slightly cut in the neck by a barber. The wound healed in a few days, followed by the development of a small nodule, which remained in a stationary condition for nearly 3 months, when it suppurated. The pus contained no bacteria, but yeast-cells were found. The yeast was obtained in pure culture from the beginning; it grows readily in all ordinary culture-media and without the formation of carbon dioxide. In the course of time the characteristic fungus-form appears. In the pus the yeast-cells were found chiefly in the interior of the corpuscles in the budding stage. In size they are as large as a nucleus of a polynuclear leukocyte. The abscess, after discharging, healed over in a few days, leaving behind a large amount of scar-tissue. Inflammations caused by pathogenic yeasts seem to be characterized by their slow evolution and their chronicity.

THERAPEUTICS.

Finsen's Phototherapy.—Valdemar Bie³ has described this treatment. Three postulates are now proved: 1. The bactericidal property of the chemic rays of light. 2. The power of these rays to produce an inflammation of the skin (*erythema solare*). 3. The power of the chemic ray to penetrate the skin. The method of this new therapy is based on the above, and consists in treating local superficial (bacterial) skin-diseases by the concentrated chemic rays. It is true that the bactericidal power of light rests in the chemic ray; the red, yellow, and green rays have little, if any, value; in the ultraviolet ray is the most powerful action. The strongest light of summer, unconcentrated, takes more than

¹ Brit. Jour. of Derm., July, 1899.

² Jour. Am. Med. Assoc., Apr. 8, 1899.

³ Phila. Med. Jour., Oct. 7, 1899; Brit. Med. Jour., Sept. 30, 1899.

an hour to destroy plate-cultures; longer yet if the germs are in the living tissue. It is only when the light is so concentrated that it has as much of the blue, violet, and ultraviolet rays as possible that the action is speedy; experiment has shown that bacteria in a stratum of agar ($\frac{1}{2}$ mm. thick) are destroyed in a few seconds. Erythema solare is induced by the chemic ray alone (Widmark; also Finsen). That these rays do penetrate the skin is a fact (Godneff). The anemic skin allows penetration to a greater degree. Remembering the possible erythema, it is necessary in this photochemic therapeutics that the light be cooled. The double object, therefore, of making the light stronger and at the same time cooler is accomplished (when working with sunlight) by an apparatus consisting of "a lens about 20 to 40 cm. in diameter. The lens is composed of a plane glass and a curved one, which are framed in a brass ring, and between them is a bright-blue, weak ammoniacal solution of copper sulphate. As one surface of the liquid is plane, and the other curved, its optical function is that of an ordinary convex glass lens. By making the lens thus a considerable cooling of the light results; the water absorbs the ultrared rays; the color also excludes a considerable amount of the red and yellow rays; the ultraviolet rays are but slightly affected in passing through the blue medium. The lens hangs on a foot, made in such a way that the lens can be raised and lowered as well as turned on a vertical or horizontal axis; therefore it is easy to put the lens perpendicularly to the sun-rays, and at such a distance as to make the light strike the desired area." When using artificial light changes in the apparatus are necessary. [For details reference must be made to the original article.] The method further requires cooling of the skin. For this is used a little apparatus consisting of a plate of quartz and a convex lens of quartz, both framed in a conical brass ring which carries 2 small tubes with 4 arms; to each arm is fastened an elastic band, by means of which the apparatus is pressed against the skin. By having cold water run through these tubes the skin is cooled sufficiently. The pressure of the plano-convex lens causes the skin to become anemic, so that the chemic rays may thus have greater penetration. In this manner an area of skin 1.5 cm. in diameter is treated for 1 hour daily. The skin will redden and swell, but, as yet, necrosis has not been observed. Various diseases have received this treatment; but only in lupus vulgaris, lupus erythematosus, and alopecia areata have a sufficient number of cases been observed to make the results conclusive. Mild cases receive this alone, but the more serious are given pyrogallie-acid ointment in conjunction. Mucous membranes are touched with a solution of iodine and potassium iodid (1 : 2 : 2) or are treated with the galvanocautery. It is claimed that the treatment is nearly painless. [From the photographs given of cases treated (see Plates 7, 8), some of the cures of lupus vulgaris are very striking and remarkable, and the subject is worthy of further study. This article is one of the most interesting and important of the year.]

X-ray Used Therapeutically.—At a meeting of the Hamburg Medical Society, Hahn¹ presented records of 2 cases of eczema of the foot, one of 4, the other of 2 years' duration, which, although subjected to a great variety of treatment, always tended to recur. Hahn finally subjected them to the action of the x-rays, with the result that they were

¹ Boston M. and S. Jour., Apr. 13, 1899.

PLATE 7.



Fig. 1.—*Lupus vulgaris*, before treatment.

(38, Phila. Med. Jour., Oct. 7, 1889.)



Fig. 2.—*Lupus vulgaris*, after treatment.

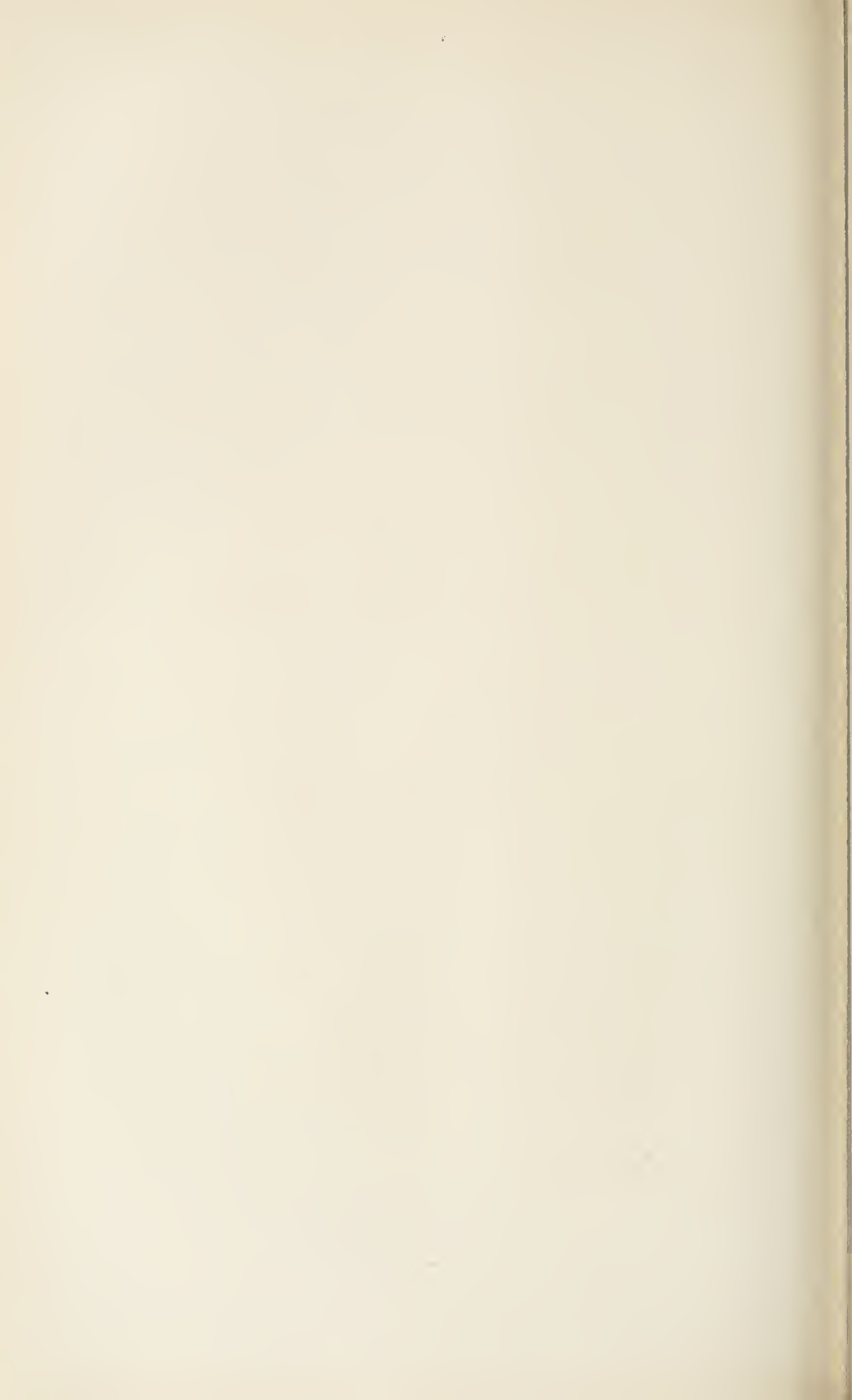


PLATE 8.



FIG. 1.—*Lupus vulgaris*, before treatment.

(Ble, Phila. Med. Jour., Oct. 7, 1899.)

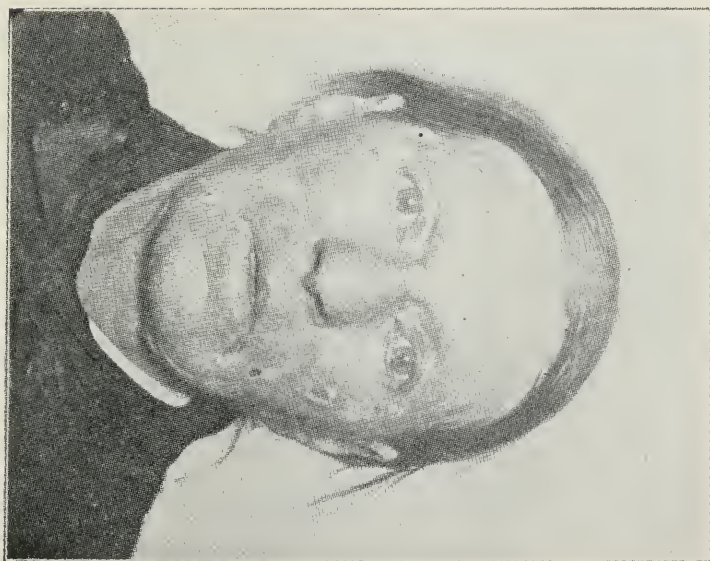


FIG. 2.—*Lupus vulgaris*, after treatment.

cured permanently. In one case the fourth application was followed by a slight reaction, as a result of which the healed surface showed a hard and somewhat raised cicatrix; in the other the cicatrix was smooth and soft.

Internal Remedies in the Treatment of Skin-diseases.—Malcolm Morris,¹ in an address delivered at the annual meeting of the Reading Pathologic Society, endeavors to define the sphere of influence of internal remedies in diseases of the skin, and to determine the conditions in which they are useful and the manner in which they may be used with best effect. As to the sphere of influence of internal remedies, they are the chief means of controlling those affections arising from a constitutional taint, such as syphilis; or from disordered action of the nervous system, as in pemphigus; or from the establishment of a depraved habit in the skin, as in certain forms of eczema, lichen, and psoriasis. First among the alteratives useful in skin-diseases must be placed arsenic. It is a cardinal rule that this remedy should never be given in acute conditions. Another rule is that it should be given in very small doses at first. A better effect is obtained by interrupting the administration for a short period from time to time. It should not be forgotten that arsenical medication, if too long continued, may give rise to evils worse than those for which it is given. It is most useful in pemphigus, in which affection it is almost a specific, in dermatitis herpetiformis, cheiropompholyx, psoriasis, lichen ruber planus, and in some cases of sarcoma. Antimony is likewise useful as an alterative, indicated in acute eruptions, especially when arterial tension is high. This drug has a twofold action, according as it is given in large or small doses. In large doses it lowers blood-pressure and reduces inflammation. In smaller doses it acts as an alterative like arsenic. Phosphorus is of use chiefly in those conditions in which the nervous system needs support, as in the later stages of dermatitis herpetiformis, in certain cases of pemphigus in which arsenic has failed, and in neurotic eczema. Potassium iodid, apart from syphilitic affections, is useful in psoriasis, in erythema keratodes, and in actinomycosis. Salicin and sodium salicylate, which have been recommended by Crocker in psoriasis, have not been found useful by the author; nor has he been able to obtain the remedial effect attributed to thyroid extract in this disease. Another useful class of remedies is internal antiseptics, of which mercury and ichthyol may be taken as examples. Nerve-sedatives, such as opium, are extremely useful in the treatment of skin-diseases. In the opinion of the author, too much has been made of the treatment of diathesis. No amount of "constitutional" treatment will alone cure eczema, psoriasis, or lupus erythematosus, or any other skin-affection.

Proper Preparation of the Yellow Oxid of Mercury Ointment.—T. E. Mitchell² writes in regard to the proper way of preparing the yellow oxid of mercury ointment for use in ophthalmologic practice. To the required amount of powder in an impalpable form on a clean glass or porcelain slab add a few drops of any bland, nonirritating fixed oil and mix well with a clean spatula; to this slowly add the necessary petrolatum, and, for reasons well known to chemie law, the powder is so far reduced by the oil that it is evenly incorporated in the vaselin. The following prescription in the hands of a competent pharmacist will

¹ Brit. Med. Jour., Oct. 15, 1898.

² Therap. Gaz., Aug. 15, 1898.

be entirely satisfactory: *R.* Olei ricin., gtt. iv; hydrarg. oxid. flav., gr. iij. M. et ad. petrolat., ʒij-iv. M. et ft. ung.

Pulvis Cuticolor.—Unna¹ recommends a number of formulas for imparting to the various ointments and powders employed in the treatment of cutaneous affections the color of the skin, so that they may be used without attracting attention. In order to obtain the exact tint desired it is necessary to employ a mixture of 3 colors: white, red, yellow or brown. As white colors, zinc oxid, lead carbonate, or bismuth oxychlorid may be used; as red, red bole, vermilion, carmin, or alkanna; as yellow, ochre, ichthyol, or umber. The following formula gives a powder which resembles the color of the skin so closely that it may be used without attracting notice: Oxid of zinc, 2 gm.; carbonate of magnesia, 3 gm.; white bole, 3 gm.; red bole, 2 gm.; rice-starch, 10 gm. For imparting the proper red tint to ointments or pastes, Armenian bole may be used in small quantities, or a few drops of a 1:500 solution of eosin.

Formulas for Cuticolor Ointments and Pastes.—Rausch² recommends the following formulas, all for external use. The ichthyol preparations are adapted whenever vasoconstricting effect is desired; sublimate can be added at will without affecting the color. 1. Cuticolor zinc ointment: Armenian red bole, 0.03 gm.; glycerin, 6 drops; zinc ointment, to 10 gm. 2. Unna's zinc paste: Armenian bole, 0.24 gm.; glycerin, 20 drops; eosin (1:500), 8 drops; zinc paste, 40 gm. 3. Unna's zinc sulphate paste: Armenian bole, 0.24 gm.; glycerin, 20 drops; eosin (1:500), 16 drops; paste of zinc sulphate, 40 gm. 4. Unna's ichthyolized zinc paste: Ichthyol, 1%; zinc paste, 30 gm.; eosin (1:500), 16 drops. 5. Ichthyol, 2%; zinc paste, 40 gm.; eosin (1:500), 20 drops. 6. Ichthyol, 3%; zinc paste, 40 gm.; eosin (1:500), 22 drops. 7. Ichthyol, 4%; zinc paste, 40 gm.; eosin (1:500), 40 drops. 8. Ichthyol, 5%; zinc paste, 40 gm.; eosin (1:100), 12 drops. Cuticolor gelanthum: Armenian bole, 0.02 gm.; eosin (1:500), 2 drops; zinc oxid, 4 gm.; glycerin, 3 gm.; gelanthum, 20 gm.

Naftalan in Skin-diseases.—Von Saalfeld³ reports its use as follows: Generally favorable in eczema, whether acute, chronic, or subacute; 5% do not bear it well; 60% are cured; the remainder improve to a varying degree. Cures are cited in *eczema madidans*, *eczema seroti*, etc. Also is it useful in light cases of *herpes tonsurans* and in *prurigo*, in *sycosis parasitaria* and *simplex*, in *lichen ruber*, *dermatitis herpetiformis*, *pityriasis rosca*.

Casein Ointment in Dermatology.—Raby⁴ states that this is: Casein, 14; alkalies, 0.43; glycerin, 7; vaselin, 21; antiseptic, 1; water, a sufficient quantity to 56-57. It is in appearance a white cream, of sufficient consistency, absolutely neutral, and, spread over the skin, forms in a few minutes a flexible and resistant varnish, which is removed simply by washing. Its principal advantage lies in its containing a considerable amount of vaselin, and with it can be incorporated a number of drugs. The alkalies, salts of alkaline reaction, and ammonium sulpho-ichthyolate thicken the ointment, and then it is necessary to add water or

¹ Jour. de Méd. de Paris, Nov. 27, 1898.

² Ibid., Nov. 27, 1898.

³ Wien. med. Woch., Apr. 15, 1899.

⁴ Nouveaux Remèdes, No. 22, 1898; Am. Jour. Med. Sci., Feb., 1899.

diminish the proportion of casein. Acids can be added only in small amount, because they coagulate the casein; but, nevertheless, 1% of salicylic acid can be incorporated. The hydroxyl derivatives of benzol, as resorcin and pyrogallol, liquefy the casein ointment, but they do not prevent the formation of a varnish upon the skin. The following combinations can be made: 1. Pyrogallol, 10%. 2. Resorcin, 2%; zinc oxid, 10%. 3. Precipitated sulphur, 5%; zinc oxid, 10%; water, 10%. 4. Ammonium sulphoichthyolate, 10%; resorcin, 1%; water, 10%. 5. Tar, 10%; water, 10%. 6. Coal-tar, 10%. The casein of commerce seems to be satisfactory. Pure casein is 10 times more expensive, but does not give a sensibly better product.

A Liquid Soap; a New Base for Remedies; New Wool-fat Preparations.—Herbert Skinner¹ suggests some new formulas which have been found useful in cutaneous diseases. A liquid soap highly esteemed is made of oleic acid, 2 oz.; alcohol (90%), 3 oz.; solution of ammonia, a sufficiency; water, to 6 oz. This may be perfumed with vanilla to disguise the odor of the oleate. The ammonia is added drop by drop until, after vigorous shaking, the odor can be barely detected. It is then allowed to stand for 7 days, and filtered through kaolin. Its cleansing properties are far superior to those of ordinary soap, and the alkalinity is scarcely noticeable. A base containing wool-fat and lanolin soap, which can be used as an ointment or as a vehicle for the application of certain drugs, is made of lanolin soap, $\frac{1}{2}$ oz.; distilled water, 2 oz.; anhydrous wool-fat, $\frac{1}{2}$ oz. The soap is liquefied in the water, and the melted wool-fat added, the whole being transferred to a mortar and vigorously triturated in order to produce a homogeneous paste. The consistency is that of resin ointment; it should be preserved in air-tight jars or made fresh. Any medicaments save acids may be added. An excellent base for cutaneous remedies consists of the yolk of 1 egg; lanolin, $\frac{1}{2}$ oz.; rose-water, $\frac{1}{2}$ oz. Triturate together the lanolin and yolk of egg; then gradually add the rose-water. Used alone, it has a very penetrating and softening effect, far more so than wool-fat alone possesses. In order to form a cream, milk may replace the rose-water, and an antiseptic may be added to preserve the preparation. Another wool-fat preparation may be made of wool-fat, $\frac{1}{2}$ oz.; glycerin of starch, $\frac{1}{2}$ oz.; white vaselin, 1 dram. This is readily absorbed by the skin, and forms a suitable base for formaldehyd even up to 10%, and no changes occur even after keeping it 6 months.

Dry Calcium Sulphohydrate as a Depilatory.—Alembert W. Brayton² states that calcium sulphohydrate can be made by heating a granulated mixture of plaster of Paris (calcium sulphate) with granulated wood-charcoal (to take off the oxygen). A high temperature is necessary, and it is best obtained by means of gas. A muffler is used—*i. e.*, set in cinders or bone-ash—and the mixture is heated to redness. By this method neither sulphuric acid nor iron sulphid is used. The dry, rose-colored or whitish product is applied to the skin in a wetted condition, or it may be put on dry and then wetted. Hydrogen sulphid is given off, which causes a rather foul smell. The substance is perfectly harmless to the skin, and may be left on any length of time, and does not even irritate abraded surfaces. It can be made cheaply.

¹ Am. Jour. Med. Sci., Mar., 1899.

² Ibid., Oct., 1898.

The Disinfectant and Therapeutic Value of Kresamin (Ethylenediamin-trikresol) in Diseases of the Skin.—Heinrich Eckstein¹ summarizes as follows: 1. In accord with the experiments of Schäffer, kresamin is a disinfectant of high value, and superior to the other preparations of the phenol series. 2. Its disinfectant action upon the tissues and its powers of penetration are very marked. 3. Besides these points, its great blandness gives kresamin an especially practical advantage. 4. Kresamin is very useful in many dermatoses, especially in the treatment of eczema, of pustular and abscess-forming dermatites, sycosis, leg-ulcers, and especially in lupoid surfaces of the extremities after operative procedures. Kresamin may be employed as a salve or a plaster-muslin, but is best used in solution as a bath or as a wet dressing. Kresamin, 25%, is a clear, watery, yellowish solution containing 25% of trikresol and 25% of ethylenediamin. Its advantages are slight toxicity, extraordinary disinfectant power, especially in the depths of the tissues (far greater than that of other disinfectants, as carbolic acid), great penetrating power, absolute nonirritation, and sedation to inflamed tissues. In the treatment of dermatitis, eczema, and acute inflammatory affections of the skin, it is applied as a moist dressing in the strength of 1 part of the 25% solution to from 1000 to 100 parts of water; or as a salve, 10% of kresamin, 10 to 50 parts of adeps lane up to 100 parts.

The Use of Xeroform in Dermatology.—Ehrmann² reports the results of the use of this remedy (tribromophenol bismuth) upon 210 patients. Externally it was employed for balanitis, moist eczemas, traumatic genital erosions, eczema of the anus and buttocks, and for that caused by iodoform. Various suppurating and gangrenous processes were treated: venereal ulcers, ulcers of the leg, tuberculous ulcers of the nose and penis, phlegmons of the hand, suppurating buboes, and incised furuncles. For suppurating wounds it was efficient in checking discharge and promoting early growth of skin. The frequent use of the remedy is not advantageous, for a too thick crust prevents discharge. The remedy was of especial value in surface diseases characterized by excessive secretion, of which balanitis is an instance. The remedy is superior to salicylic dusting-powder in that it is not caustic, quickly destroys the odor, and finally permits regeneration of normal epidermis. Internally administered, it has proved of benefit in anal eczema, this symptom being so frequently associated with habitual constipation, intestinal atony, and marked flatulence, an intestinal antiseptic is required. The constipation was relieved in all save 2, and in these the flatulence was lessened. The chronic urticarias, as well as other dermatoses of autotoxic origin, are benefited by the use of this intestinal disinfectant. Of 25 patients treated, 23 were cured.

Therapeutic Application of Tannoform.—Hesse³ of Darmstadt states that tannoform is one of the best local remedies for decubitus, diabetic gangrene, and the various forms of moist eczema, its siccative and antihidrotic properties being peculiarly valuable. He has used it with equally good results in impetigo, balanitis, *ulcus molle*, vaginal blennorrhœa, and herpes preputialis, as well as in hemorrhoids, sores, fissures, and rhagades. The use of the remedy gave decided results also

¹ Jour. Cutan. and Gen.-Urin. Dis., Jan., 1899.

² Am. Jour. Med. Sci., Feb., 1899.

³ Am. Médico-Surg. Bull., Aug. 10, 1898.

in gonorrhea. Tannoform was used, besides, as a wound-antiseptic after operations, on account of its innocuousness and nonirritativeness. Its special value as a remedy for excessive perspiration is exceeded by that of no other, and the remedy may be deemed a specific in all forms of bromidrosis and hyperidrosis. For perspiring feet, a dusting-powder consisting of 1 part of tannoform and 2 parts of talcum is valuable; the remedy is applied pure in only very severe cases. In decubitus and in eczema a 10% tannoform ointment has yielded excellent results.

Egg-albumin in Skin-diseases.—S. Lewith¹ states that white of egg is useful in cases of much irritation of the skin and moderate exudation. It is applied as follows: The hands are thoroughly washed, an egg is opened, and the white is separated from the yolk, and is well stirred up with the finger in a little glass. The affected part is then smeared by means of the finger with a thin layer. It forms a delicate, friable membrane, which covers the tissues beneath and exerts on them a slight pressure. The itchiness is soon diminished or removed, and a pleasant coolness is felt.

Lactophosphate of Lime in Acne and Furunculus.—H. S. Purdon² refers to the researches of Dusart on this drug, and states that he has derived benefit from its use when given in certain forms of acne, especially when large or hypertrophied, and also in boils. In cases of the latter, combined with iron, it is more useful; while a palatable recipe, when codliver-oil is thought to be required, is the following: Take of gum arabic, 5x; water, 5j; syrup of lactophosphate of lime, 5iij; codliver-oil, 5iv; essence of bitter almond, miiij. Phosphate of lime is not merely a drug "able to harden bones," but becomes an active agent in nutrition. In acne and similar diseases due to nutritive debility it is often distinctly valuable—often more so than calcium sulphid.

Galvanocautery in Neoplasms of the Skin and Mucous Membrane.—Alexander J. C. Skene³ reports several cases of neoplasms treated in this manner. One of the cases was a vascular nevus situated between the eyes of a child 5 months old. It had grown very rapidly. Electrolysis was employed, and no trace of the nevus remained. Another case was that of an epithelioma on the lower lip of a lady, which was removed by the galvanocautery. A third case was that of a nevus pilosus or hairy papilloma on the cheek, removed by cautery, only a small patch of scarred tissue, which was barely visible, remaining. The results obtained in this way, says the author, compared with those obtained with caustics, are markedly in favor of this operation.

Unguentum Pomadinum Aromaticum.—P. G. Unna⁴ suggests this name for a new vehicle to be used in ointments. Two requirements must be met: 1. It should grease the scalp, but not make the hair disagreeably sticky. 2. It should not suggest the barber-shop; its odor must be pleasant though faint; if possible, it should exert an influence distinctly antiseptic. This is answered, he claims, by the following: R. Tinct. aromat., 20 parts; ung. cereum (cera alb. parat.), 80 parts.—M. ft. ung. The formula of the tinct. aromat. is: Cinnamon, 5 parts; ginger, 2 parts; galangal (root), 1 part; cloves, 1 part; cardamom, 1

¹ Bi-monthly Bull. Univ. Coll. of Med., Jan.-Feb., 1899.

² Am. Jour. Med. Sci., Oct., 1898.

³ N. Am. Pract., Aug., 1898.

⁴ Monatsh. f. prakt. Dermat., June 15, 1899.

part; wine spirit (dil.), 50 parts. Finally, the addition of gelanthum (20%), reducing the ung. ceruum to 60%, insures immediate drying and no oiliness of the hair.

Sugar in Dermatology.—Hodard¹ has found great service from the siccative and keratoplastic properties of powdered sugar when added to various unguents for use in moist eczema, impetigo, ethyma, and other vesicular and pustular dermatoses. The author uses the following formula: R. Lanolin, vaselin, powdered sugar, zinc oxid, $\bar{a}\bar{a}$ 300 gr.; glycerin, sulphur, $\bar{a}\bar{a}$ 150 gr.—M.

Mercurial Ointment made with Paraffin.—Herbert Skinner² states that ointment of mercury made with soft and hard paraffin is absorbed more readily than when made with any other base. He regards the preparations of petroleum as the best fatty lubricators that we possess.

An Excellent Cold-cream Ointment.—H. Skinner³ gives the following formula: Benzoated lard, $\bar{z}\bar{i}\bar{v}$; spermaceti, $\bar{z}\bar{j}$; borax, $\bar{s}\bar{s}\bar{s}$; glycerin, $\bar{z}\bar{j}$; cologne-water, $\bar{s}\bar{i}\bar{j}\bar{s}\bar{s}$.

SYPHILIS.

The Histopathology of Syphilis.—Herzog,⁴ as the result of his own studies and observations in connection with the histology of syphilis, agrees with Rieder that the vascular changes, which are among the most prominent lesions observed in syphilis, are mostly confined to the veins and lymphatics, the arteries being comparatively free. He concludes that syphilis primarily affects the lymphatic system and spreads by the lymphatics. The infection of the bloodvessels takes place from the perivascular lymph-spaces. The veins being less resistant show the most marked changes; while the arteries are not so prominently affected. The living syphilitic poison is originally, and probably permanently, located in the lymphatic system, whence it invades the bloodvessels, leading to general manifestations. After a general outbreak, either as the result of antisymphilitic treatment or independently of it, hematogenous immunity is established, which lasts only a limited period, when a new invasion of the bloodvessels from the lymphatics takes place.

The Etiology of Syphilis.—According to Van Niessen,⁵ syphilis is a chronic infectious disease, the contagium reaching the blood through the lymphatics. This contagium is demonstrable in all stages of the disease, from the moment of its entrance into the blood, by staining and by cultivation. It may be found in the urine, milk, semen, sweat, sputum, and feces. The virus is a pleomorphic form of bacillus closely related to the more highly organized fungi, such as the actinomyces. The detection of this organism in the blood is of the greatest importance in the diagnosis of syphilis. Syphilis is communicable and inheritable in all its stages; and, with our present remedies, is absolutely incurable.

Stages and Forms of Syphilis.—Adami,⁶ in a paper devoted to a discussion of the several stages and forms of syphilis, with especial reference to its hepatic manifestations, formulates the following conclusions: In sundry cases the primary cutaneous or epithelial manifestations

¹ N. Y. Med. Jour., June 17, 1899.

³ Ibid.

⁵ Internat. Med. Jour., July, 1898.

² Brit. Jour. of Derm., June, 1899.

⁴ Chicago Med. Recorder, Apr., 1899.

⁶ Canad. Pract., July, Aug., 1898.

may be absent. Individuals may fail to present recognizable primary or secondary symptoms, and yet may eventually develop definite tertiary lesions. In subjects relatively insusceptible the disease may be limited to the primary cutaneous manifestations not followed by secondary lesions. Like tuberculosis, congenital syphilis begins with what may be termed the secondary stage of the acquired disease—*i. e.*, the stage of general dissemination of the virus through the organism. There is a lack of sharp definition between the anatomic changes in early and late generalized syphilis, as is well shown by a study of the syphilitic liver. In the liver of the newborn infant with external evidences of the secondary stage of the disease there may be several varieties of syphilitic manifestations. All the changes seen in congenital syphilis of the liver are those usually considered to characterize the tertiary stage of the disease. The lesions of the congenital and the acquired disease are identical, and are brought about by the same processes.

Intravenous Injections in Syphilis.—C. F. Marshall¹ holds the following views: 1. The intravenous injection of mercury has not been proved to have any advantage over other methods as regards either rapidity of disappearance of symptoms or convenience. 2. It is obvious that in private practice it is almost impossible to carry it out even if the patient consents—which is very doubtful. 3. Chopping has said “we are able only to judge of effect by quantity administered”; and hence “it is very important to know, if possible, the exact quantity of mercury introduced into the circulation. In answer to this I would state that if symptoms of mercurialization were the same in all individuals, such measurement of the dose administered would be scientific. But, as we know, there are very great differences in the way different persons react to mercury, and our only guides in its administration are the symptoms produced, together with the rapidity of disappearance of syphilitic lesions; therefore I consider the exact dosage of minor importance.”

Syphilis Treated by Intravenous Injection.—A. Chopping² has reported 84 cases so treated. A tourniquet is applied to the arm, and when the veins stand well out the needle of a hypodermic syringe containing 20 minims of a 1% solution of cyanid of mercury is introduced into the vein selected. The injection is made every morning unless diarrhea occur. The advantages are: 1. As the patient is treated daily he is under constant observation. 2. The exact quantity of mercury taken is known. 3. The patient is brought quickly under the influence of the drug. 4. The rapidity with which serious lesions clear up. In 2 cases only did salivation occur; antiseptic washes controlled this. In the worst cases adjuvants, such as codliver-oil, iron, iodid of sodium and ammonium, were used. The average stay in the hospital was 23 days; all the cases, with but 1 exception, showed marked and rapid improvement.

Hereditary Syphilis and Explosive Phagedena.—Concerning a severe case in which mercury in all its forms was taken without success, Besnier³ said that in such rebellious cases it was necessary to exceed all ordinary doses and proceed to the extreme limits of toleration. Fournier recalled the fact that in a recent case in which the injection of calomel and inunction had been employed separately without avail, a cure

¹ Lancet, Apr. 1, 1899.

² N. Y. Lancet, Apr., 1899.

³ Med. Bull., Apr., 1899.

resulted when both these methods were used in conjunction. Galezowski pointed out that it is useful not only to carry out an intensive treatment, but also to suppress the administration of the iodid, because the latter eliminates the mercury, and is therefore objectionable in cases in which mercurialization should be carried as far as possible.

Iodipin in Syphilis.—V. Klingmüller¹ has reported success in the treatment of tertiary lues by iodipin. He claims for it a specific action, and also that the subcutaneous administration is acceptable and effective. The tissues are kept under its influence a long time by injections several days apart without unpleasant results. Later reports are even more satisfactory, especially in bone-lesions. Iodipin is an organic combination of iodin and sesame oil.

Danger of Error in Diagnosis between Chronic Syphilitic Fever and Tuberculosis.—Janeway² directs attention to the possibility of errors in diagnosis occurring through ignorance of the fact that fever may attend the late manifestations of syphilis, more particularly of visceral syphilis; and in illustration reports the histories of 7 cases with various forms of late syphilis in which a history of tuberculosis had been made on account of the presence of more or less continuous fever. In all these cases the administration of specific remedies caused cessation of the fever and restoration of the patient's health.

Gastric Syphilis.—Flexner³ reports a case of perforating syphilitic ulcer of the stomach. The patient was a man, 52 years of age, who had been ill for a period of 3 years, suffering from spells of vomiting, irregular chills, and, after a time, ascites. After having dined upon highly indigestible food he was seized with severe abdominal pain accompanied by tympanites, and death occurred within a few hours. The autopsy disclosed old adhesions between the liver, stomach, spleen, and pancreas; a large hepatic gumma; a syphilitic ulcer of the stomach, with perforation and consequent peritonitis. The author believes the ulcer to have been due to an indirect form of necrosis of the mucous membrane, brought about by the combined softening of the submucous gummatous infiltration and the obstruction and obliteration of bloodvessels in the same situation.

Syphilitic Reinfection.—Tarnowsky⁴ supports his views concerning the curability of syphilis and the possibility of reinfection by the report of the following case: A man, 30 years of age, consulted him for 2 ulcers on the skin in the left inguinal region which followed repeated intercourse. The base of these ulcers was hard, and the glands of both inguinal regions were swollen. Seven weeks after the first appearance of the ulcers a syphilitic erythema appeared upon the extremities and trunk, which disappeared after the use of mercurial inunctions. A year later a papular eruption was noticed in the left palm, which was removed by mercurial inunctions. In the third year swelling of the left inguinal gland occurred, which subsided after mercurial treatment. In the 7 following years there were no syphilitic manifestations. Ten years after the first syphilitic lesion 2 small ulcers were noticed, 4 days after a suspicious intercourse, in the sulcus glandularis. These were cauterized with carbolic acid, but the edges became infiltrated and hard, and 3½

¹ Berlin. klin. Woch., No. 25.

² Am. Jour. Med. Sci., vol. cxvi., 1898.

³ Ibid.

⁴ Vrach, xix, 1898.

months later there were dry papules upon the head of the penis, a papular erythema upon the trunk, scaly papules on the right palm, and an impetiginous syphilide in the scalp. From this case the author concludes that syphilis is entirely curable by proper treatment.

A Calcified Gumma in the Suprarenal Gland in Congenital Syphilis.—Vinogradov,¹ in 420 autopsies of children with congenital syphilis, but once found a gumma in the suprarenal gland. In this single instance the subject was a girl, about 2 months old, dead of diphtheria. There were changes in the liver, bones, kidneys, and in the right suprarenal gland. The central portion of the last was occupied by a nodule with a fibrous capsule, in the periphery of which were pinhead-sized calcareous concretions. The microscope showed the alterations to be due to congenital syphilis.

Syphilitic Phlebitis.—Heuzard² concludes that syphilis may affect the veins; causing 2 forms of phlebitis. The first form is acute or subacute, and occurs in the secondary period. The second form is chronic, and corresponds to the tertiary period; it occurs as a localized process—gumma—or as a sclerosis of the vein. Syphilitic phlebitis affects by preference the veins of the lower extremities. The prognosis is favorable; the average duration about 2 months. The treatment should be that commonly known as mixed.

Proksch³ has collected 107 cases of syphilis of “the intraparenchymatous and extraparenchymatous veins.” Of the latter, it is chiefly the cutaneous veins and those of the lower extremities that are affected, either with secondary forms of syphilis or gummas. There are no pathognomonic symptoms, and a diagnosis must be made by considering the accessory symptoms. Occurring during the secondary period, several veins may be affected at once, or one after the other. Gummata of the veins are in most cases circumscribed. Specific treatment, together with local applications and rest, will usually cause the disappearance of the trouble.

MISCELLANEOUS.

The Skin Affected by the X-ray.—V. Zarubin⁴ gives a detailed account of our knowledge of its influence on the healthy and the diseased skin. 1. Therapeutics: Observers agree on its value in lupus vulgaris, chronic eczema, certain cases of varicose ulcers of the leg, acne vulgaris, lupus erythematosus, hypertrichosis, favus, psoriasis, and elephantiasis. 2. Injury to normal tissue: Cases of dermatitis, necrosis, abscess-formation, etc. are noted. 3. Unna and others, in experiment, find the skin colored brown; this seems due to an increase in pigment of the upper layers of the corium, that of the epiderm receiving no addition. 4. The mode of action is thought by some to be trophic, by others to be chemic; few agree in explanation. At the close of the article an index of the literature of this subject is given.

Subacute Infectious Purpura.—Mossè and Iversenc⁵ report the case of a youth, aged 17 years, who, after some excesses and a slight

¹ Russ. Arch. f. Path., klin. Med., u. Bact., 1898.

² Thèse de Paris, No. 179, 1898.

³ Jour. Cutan. and Gen.-Urin. Dis., Dec., 1898.

⁴ Monatsh. f. prakt. Dermat., May 15, 1899.

⁵ Jour. des Mal. cutan. et Syph., Nov., 1898.

traumatism, showed lassitude, and later a typhoid condition, accompanied by marked elevation of temperature. An eruption of macules appeared, which rapidly extended; melena followed, and death shortly occurred. During life examination of the blood showed it to be sterile; but at the autopsy 3 varieties of microorganisms were found in the liver—the *Bacterium coli*; an organism resembling the colon-bacillus externally, and a short, thick bacillus. In the lungs streptococci were found. The authors regard the previously debilitated condition of the patient as furnishing a soil favorable for infection. Experimental inoculations practised upon animals produced in one instance hemorrhages into the lungs; in others, the characteristic picture of infection with the colon-bacillus.

A Pigmented Affection of the Skin Due to the Demodex Folliculorum.—DeAmicis¹ has described a parasitic affection of the skin due to the *Demodex folliculorum*, which appeared as a pigmented patch, of a café-au-lait color, upon the chin and lip of a woman, aged 27 years. The discoloration was at first thought to be due to the *Microsporon furfur*, but this fungus could not be found. Large numbers of demodex were present, however, and treatment directed to the removal of this organism was followed by gradual disappearance of the pigmentation. Majocchi likewise has seen 2 cases in which the demodex was found in pigmentation of the skin accompanied by slight desquamation.

In **senile pruritus** Parisat² recommends the following plan of treatment: The bowels must be kept well open and a milk-diet employed. In addition, benzonaphthol is given in daily doses of a dram. Improvement begins within 24 hours, and a cure results speedily in the most obstinate cases.

Leredde³ regards **methyl salicylate** as the most effective remedy in the treatment of pruritus, affording relief very speedily. He recommends the following ointment: *R*. Methyl salicylate, 3ss; zinc oxid, vaselin, *aa* 3v.—M.

Eruptions of the Face Due to Nasal Pressure.—Murray⁴ reports a number of cases of facial eruption dependent upon reflex neurosis caused by nasal pressure. These eruptions were of an inflammatory type, in most instances resembling eczema or acne. Such eruptions may arise from pressure from hard or soft parts. In those cases in which there were intranasal spurs the cutaneous trouble did not appear before puberty, for the reason that such spurs do not occur before that time. The muddy complexion and friable skin noted in some of these cases are characteristic of nasal obstruction. These eruptions disappeared promptly after operation. They appeared first and were always worse on the side corresponding to the pressure, and cleared first on the side opposite to the pressure.

Milliamperemeter Recommended in Electrolytic Work.—M. B. Hutchins⁵ writes on the necessity of measuring the current in all electrolytic work. Accuracy is required for satisfactory results. He insists that it is impossible to state the number of cells suited to a given case, as resistance in the tissues varies in individuals and in the various locations of the body. Interesting experiments are given.

¹ Brit. Jour. of Derm., Jan., 1899.

² Med. News, June 3, 1899.

³ Treatment, Apr. 27, 1899.

⁴ Med. Rec., Mar. 25, 1899.

⁵ Jour. Cutan. and Gen.-Urin. Dis., May, 1899.

MATERIA MEDICA, EXPERIMENTAL THERAPEUTICS, AND PHARMACOLOGY.

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OF NEW YORK.

OF PHILADELPHIA.

THE trend of therapeutic investigation during the past year has been rather toward a working out of details and following out of theories proposed than in presenting new measures. The practice has been in the direction of harmonizing the results of laboratory work and bedside-study. Therefore no startling claims have been advanced for novel methods nor have new remedies been unduly lauded. Since pathology is teaching us that the list of diseases caused by or in fairly constant relation to pathogenic germs should be further extended, the questions bearing upon toxins and antitoxins have been prominent in the literature. While definite statements cannot as yet be made as to what an antitoxin is, save as inferred from its effects, it is likely that in the near future our knowledge will rest upon a secure foundation. A large amount of empirically reached information is at hand as to the effect of the various antitoxins upon diseases associated with toxins other than those to which they are supposed to be opposed. Of the antitoxins, other than diphtheria, none has reached so secure a position, although evidence as to their value is gradually accumulating. The exploitation of the yellow-fever serum by certain scientifically irresponsible persons has done much to discredit the really good work which others have performed in that direction. In opotherapy the thyroid extract has reached a secure and well-defined position. The suprarenal extract has been found to be a powerful vaso-constrictor, and its field of usefulness has been well indicated during the year, with the prospect of further extension. Various morphin preparations have been presented, and while their advantages have been fairly well established and their usefulness is assured, it is by no means clear that by them habit may not be established, and thus may they be open to the same objection as are the more familiar forms. The preparations of soluble silver constitute a real advance in local, and offer hope in general, therapy. The testimony as to their value is marked by practical unanimity. Which of the organic salts shall prove to be the best for local use time alone will determine; at present the long-used nitrate seems likely to be effectually superseded. That the number of new coal-tar products offered is diminishing is reason for congratulation. Of more importance is the general disposition on the part of physicians to abandon their use as antipyretics and to place a proper estimate upon fever as a symptom. As analgesics they have an important place, and investiga-

tion in the direction of ascertaining which is the most effective and at the same time the least harmful to the patient is in the line of substantial progress. The year has been satisfactory in that therapeutic work has been earnest, thorough, and practical. As the findings of the laboratory and the results at the bedside come into closer relation to each other, conjecture will give place to prediction and empiricism yield to demonstration.

Aconite.—Cash¹ believes that the uncertainty of aconitin is due to mixture with the other alkaloids of aconite—benzaconin and aconin—which differ to a great extent in potency and physiologic action. Aconitin is about 200 times as toxic as benzaconin, and 2000 times as toxic as aconin. Aconitin in small doses slows and steadies the pulse, with a slight decrease of pressure; benzaconin has a like effect in a much more marked degree; while aconin lacks this property. Aconitin produces the characteristic tingling of the mucous membranes and impairs sensation generally by its action on the peripheral sensory nerves. The other alkaloids have no such action. They all have a bitter taste. Death from aconitin is primarily due to respiratory failure; although in small doses it first stimulates respiration, it finally depresses it by paralyzing the sensory fibers of the vagi. Benzaconin acts much like aconitin, except that it has very little effect upon the sensory nerves, while it depresses the motor group and also the muscle-fibers. It also lacks the antipyretic action of aconitin. Aconin is not such a cardiac depressant as aconitin and benzaconin, but actually strengthens the heart and opposes the asyncope and incoordination which aconite produces upon the motor system; it is a decided depressant, and acts like curare.

Airol.—Airol, or bismuth oxyiodogallate, is still considerably used as an antiseptic on account of the advantages it possesses over iodoform in its cheapness and freedom from disagreeable odor. Boncrisiani,² Hansell,³ and Taussig⁴ speak very highly of it in sluggish ulcers, abscesses, phlyctenular conjunctivitis, otitis media, gonorrhea, and suppurative rhinitis. As an injection in gonorrhea, Taussig recommends a mixture of airol, 10 parts, and of glycerin and distilled water, of each 50 parts. To wounds and ulcers it is applied in powder-form and in 10% gauze. Wherry⁵ has found airol very serviceable in corneal ulcer with hypopyon. The powder is flicked into the eye every few hours, the remains of the previous application being removed with a boric-acid wash. According to the author, the ulcer heals and the pus is absorbed in a greater proportion of cases than by other methods.

That airol is not altogether free from the toxic action exerted by bismuth salts when applied externally is evident from the following case reported by Aemmer,⁶ who injected into a psoas abscess about an ounce of a 10% emulsion of airol with equal parts of glycerin and olive oil. In the course of 3 days symptoms of bismuth poisoning appeared—nausea, stomatitis, black discoloration of the mouth, etc.—which did not subside until the abscess was opened freely and the airol allowed to escape. Aemmer concludes that airol is only relatively harmless, and that it should not be used with glycerin, in which it is soluble.

¹ Brit. Med. Jour., Oct. 8, 1898.

³ Merck's Archives, Jan., 1899.

⁵ Brit. Med. Jour., Jan. 15, 1898.

² Wien. med. Woch., Jan. 7, 1899.

⁴ Wien. med. Presse, No. 45, 1898.

⁶ Centralbl. f. Chir., Apr. 23, 1898.

Cerato¹ confirms the good results previously obtained with aïrol as an **intestinal antiseptic**. He has employed the drug in 9 cases of chronic intestinal catarrh, in which colombo, bismuth, tannigen, and tannalbin had failed to give relief. After using aïrol in doses of from 5 to 8 gr., frequently repeated, for a short period, the diarrhœa permanently disappeared. Cerato attributes the good effects not alone to the astringent properties of the drug, but also to the iodine that it contains.

Aloes.—Dohme² concludes from a study of the chemistry of aloes that: 1. Curacao aloes are as efficient as, and, being much cheaper, should be preferred to, Socotrine aloes; the greater portion of the latter as sold today is made up of the former. 2. The resin of aloes is an ether or organic salt, and varies according to the kind of aloes and the varying constituents of the acid, the alcoholic constituents being aloresinotannol, and being the same in both Barbadoes and Cape aloes, the only specimens thus far examined. 3. Aloin contains emodin, to which its laxative properties are probably due. 4. Many laxative drugs besides aloes, such as senna, cascara sagrada, rhubarb, and buckthorn-bark, owe their laxative property to this substance, emodin, or some substance like it, derived from anthroquinon, and homologous or isomeric with it.

Ammonium Fluorid.—Baudon³ states that Robin has obtained excellent results from ammonium fluorid in the treatment of flatulent dyspepsia. He is of the opinion that the drug checks lactic, butyric, and acetic fermentations not only by destroying the ferments, but also by modifying favorably the influence of gastric juice on digestion of albuminoids. Ammonium fluorid has no deleterious action on the chemie ferments of the stomach and no untoward effect on the organism. [Inasmuch as hydrofluoric acid, in the proportion of 1:3000, acts powerfully upon fermentation, it is likely that the salt is efficacious, as stated. The fluorids, however, are credited with producing nausea and readily deranging the digestive system.]

Aneson.—This is the trade-name for a watery solution of trichloropseudobutyl alcohol or acetone-chloroform which has been recently put forth as a substitute for cocain. Solutions of 1% or 2% equal in anæsthetic power about 2% solutions of cocain. The solution is permanent, and is said to be unirritating and nontoxic. Sternberg⁴ recommends it as a safe and useful anæsthetic. Marsbach⁵ contends that in point of harmlessness aneson is superior to all hitherto-known remedies for **local anæsthesia**, and that it is equally useful when employed according to the method of either Schleich or Oberst.

Antipneumonic Serum.—Marsalongo and Franchini,⁶ at the Ninth Italian Congress for Internal Medicine, held Oct., 1898, reported the results of the administration of antipneumonic serum in 10 cases of pneumonia. Three deaths were recorded—all being alcoholic subjects—showing evidences of chronic nephritis. Its use seems to be free from general or local disturbance. Its use is recommended in the severest cases—those complicated by degenerated arteries, chronic nephritis, chronic valvular disease, and alcoholism—as giving better results than any other

¹ Gaz. degli Ospedali, No. 142, 1898.

² Am. Jour. Phar., No. 8, 1898.

³ Gaz. hebdom. de Méd. et de Chir., Oct. 2, 1898.

⁴ Klin. Therap. Woch., Sept. 25, 1898.

⁵ Münch. med. Woch., No. 3, 1899.

⁶ Riforma Med., No. 31, 1898.

method. [So far as death in pneumonia results from the activity of the toxins, an antipneumonic serum promises much. However, the mechanical problems must not be ignored while this method is employed.]

Antitoxin of Diphtheria.—It may be said that the antitoxin treatment of diphtheria has now passed beyond the experimental stage, and that subsequent observations can only serve to determine its exact limitations. The statistics compiled by the Department of Health of the city of Chicago¹ demonstrate conclusively the great value of the antitoxin treatment, especially when administered early in the disease. Of 4071 cases of diphtheria verified bacteriologically and treated with antitoxin, 276 died, a mortality-rate of 6.77%. This is a lower rate than that reached by Baginsky (8.6%) in the wards under his care. These cases may be considered as fairly representative, since they occurred over a period of nearly 3½ years. In 355 cases treated on the first day of the disease there was only 1 death, a mortality of only 0.28%; in 1018 cases first treated on the second day there were 17 deaths, a mortality of 1.67%; in 1509 cases first treated on the third day of the disease there were 57 deaths, a mortality of 3.77%; in 720 cases first treated on the fourth day there were 82 deaths, a mortality of 11.39%; and in 469 cases first treated later than the fourth day there were 119 deaths, a mortality of 25.37%. Since antitoxin has been used the death-rate from diphtheria has fallen 43% as compared with that for the previous 3 years, when other methods of treatment were in vogue.

The Committee of the Clinical Society of London² reports the results obtained in 633 cases of diphtheria treated with antitoxin. The conclusions are: 1. The general mortality is reduced one-third. 2. The mortality in tracheotomy falls by one-half. 3. Extension of membrane to the pharynx very rarely occurs after the administration of antitoxin. 4. The duration of life in the fatal cases is decidedly prolonged. 5. The number of fatal cases is less when antitoxin is used early in the illness than in those which do not receive it until a later period. 6. The frequency of the recurrence of paralysis is not diminished, but the percentage of recoveries in cases with paralysis is slightly increased. 7. Rashes are produced in about one-third of the cases, and are attributable to the antitoxin. 8. Pain and occasionally swelling about the joints are produced in a small number of cases. 9. Even when used in very large doses, no serious ill-effects have followed the use of antitoxin.

Concerning the **duration of immunity** conferred by a single injection of antitoxin, Morrill³ draws the following conclusions as the result of his experience in immunizing a large number of children in the Boston Children's Hospital. Immunity in any given case of no matter how thorough exposure to diphtheria may be conferred for at least 10 days by the injection of a small dose (100 to 250 units) of serum, provided it is given 24 hours previous to actual infection. A larger dose (250 units for a child of 2 years, up to 500 units for one of 8 or over) will confer safety for 3 weeks—or, to be a little more conservative, let us say 20 days—under similar conditions. No harm will result from the treatment in a vast majority of cases of *sick* children, and probably in no case of a

¹ Bulletin of the Department of Health, Feb., 1899.

² Practitioner, June, 1899.

³ Boston M. and S. Jour., Mar. 3, 1898.

healthy child, provided the serum used is up to the present standard of purity.

Zahorsky¹ reports that he has used **antitoxin by the mouth** for the purpose of immunizing 14 cases in private practice, and 150 in the Bethesda Foundling Home, St. Louis. Twice in this institution, after an outbreak of diphtheria among the inmates, were the infants given antitoxin or antitoxic milk by the digestive tract, and none contracted the disease. Clinically, therefore, it seems demonstrated that antitoxin can be absorbed by the digestive tract. Zahorsky concludes that antitoxin by the mouth is absorbed after 36 hours, and therefore as a prophylactic measure is perfectly effective.

Experiments have been made during the past year by several observers with the view to determine whether the antitoxin of diphtheria has any **therapeutic value in diseases other than diphtheria**. Bessone,² in a series of 100 cases of pneumonia, treated 21 by injections of antidiphtheric serum. No untoward effects were observed. The mortality in the 21 cases was 4.76 %; while among the remaining 79 cases it reached 16.45 %. Bessone is of the opinion that the serum assisted in preventing complications, and aided the organism in throwing off the infection.

Cerioni³ confirms the report originally made by Latti that antidiphtheric serum is of value in whooping cough. Cerioni claims to have obtained most satisfactory results with the serum in 15 cases of pertussis, in many of which there were severe pulmonary complications, such as bronchitis, bronchopneumonia, and epistaxis.

Gilbert⁴ also reports excellent results from the use of the serum in 9 cases of **whooping cough**, in 2 of which there was also diphtheria. The duration of the paroxysmal stage never exceeded 5 to 10 days, and the number of paroxysms were speedily lessened and their severity modified. Vomiting was always controlled by the injections. Cutaneous eruptions were no more common than in diphtheria.

Mygind⁵ has treated 10 cases of **ozena** with the antitoxin of diphtheria, employing from 500 to 1000 units. No other treatment was employed. The observations extended over a period of 3 to 8 months. The injections produced congestion of the mucous membrane, and were followed by disappearance of the fetid odor and cessation of the formation of crusts. Similar good results have been reported by Gradenigo, Catterina, Molinié, Compaigné, and others. [The reported good effects of antidiphtheric serum in diseases other than diphtheria naturally give rise to the question whether the active agent in such cases is not the horse-serum itself, and not the antitoxin.]

Antitoxin of Malta Fever.—Fitzgerald and Ewart⁶ report a case of Malta fever in which they injected subcutaneously 5 drams of antitoxin, the temperature having been subnormal for 5 days. The following day 5 drams were again injected, the temperature being 99° F. For the next few days the temperature varied between 98° and 100° F. One week after the first injection severe urticaria developed. At the end of the second week another 5 drams of antitoxin were injected. The temperature rose to 104.6° F., and the patient was very ill. In a few

¹ Arch. of Pediatrics, Mar., 1899.

² Ann. de Méd. et Chir. Infant., Feb. 15, 1899.

³ Sem. méd., No. 41, 1898.

⁴ Rev. méd. de Suisse Romande, June 20, 1899.

⁵ Jour. of Laryng., London, Aug., 1898.

⁶ Lancet, No. 3946, 1899.

days, however, the temperature fell to normal and the patient became convalescent.

Antitoxin of Tetanus.—During the past year many cases of tetanus treated by the subcutaneous administration of antitoxin have been reported, but the average mortality does not seem to have been materially reduced by this method of treatment. The failure of the antitoxin when administered subcutaneously has been attributed to the fact that the tetanus-bacillus, unlike most pathogenic microorganisms, does not migrate, but remains localized in the part of the body to which it has been introduced, where it generates with great rapidity toxins which have a special affinity for the cells of the central nervous system. In consequence of this peculiar action, it is claimed that the antitoxin, while effective in neutralizing the toxin circulating in the blood, has little or no power in destroying that which has been deposited in the cells of the cerebrospinal axis. To offset this difficulty, Roux and Borrel suggested the intracerebral injection of the antitoxin. These observers treated 45 guinea-pigs in which tetanus had been produced by intracerebral injection of the serum, and 35 recovered. Of 17 other animals treated by the subcutaneous use of the antitoxin in much larger doses, only 2 lived. Of 17 tetanized animals that received no antitoxin all died. An excellent summary of the results obtained by the method of treatment in acquired tetanus in man is given in the *Univ. Med. Mag.*, Feb., 1899. The first case so treated was that of Chauffard and Quénu.¹ Cases have since been recorded by Garnier,² Ombrédanne,³ Bacaloghn,⁴ Robert,⁵ Delmas,⁶ Heckel and Regnès,⁷ DuHamel,⁸ Hue,⁹ Church,¹⁰ Robinson (reported by Rambaud),¹¹ Johnson (reported by Rambaud),¹² and Semple.¹³ Of these 13 cases, 6 recovered (those of Chauffard and Quénu, Garnier, Ombrédanne, DuHamel, Church, and Semple) and 7 were fatal. One case (that of Robinson) died 11 days after the total disappearance of tetanic symptoms, apparently of acute nephritis of toxic origin. The mortality of the cases treated by intracerebral injections of antitoxins is about 52%. Without entering into a detailed review of the cases, it may be stated that a study of the report seems to indicate that they represent an average run of an equal number of examples of the disease. The proportion of deaths, while higher than that given in Cowling's collection of cases (44%), is much lower than the mean of all statistics. Whether the next series of an equal or greater number of cases will show results as good, time alone can determine.

Kocher¹⁴ recommends the following **method of administering** intracerebral injections: After shaving and cleansing the anterior half of the scalp, the point at which the injection is to be given is to be determined with the aid of a craniometer. The fluid is to be injected into the lateral ventricles, and in so doing the motor centers should be avoided. It has been found that a point $2\frac{1}{2}$ to 3 cm. from the anterior fontanel meets all indications. After cocaineizing the scalp in this region a bone-drill is

¹ Presse méd., No. 5, 1898.

³ Ibid., Sept. 3, 1898.

² Presse méd., No. 70, 1898.

⁷ Ibid., Sept. 7, 1898.

⁹ Jour. des Prat., Nov. 19, 1898.

¹¹ Ibid.

¹² Ibid.

² Ibid., No. 70, 1898.

⁴ Gaz des Hôpitaux, No. 70, 1898.

⁶ Ibid., Sept. 17, 1898.

⁸ Méd. mod., Aug. 10, 1898.

¹⁰ N. Y. Med. Jour., Dec. 17, 1898.

¹³ Brit. Med. Jour., Jan. 7, 1899.

¹⁴ Centralbl. f. Chir., No. 22, 1899.

applied at the selected point, and a hole drilled through the scalp and cranium; upon withdrawal of the instrument the hypodermic syringe is inserted and the serum injected into the lateral ventricles. Church¹ gives the following measurements as a guide in applying the trephine: $2\frac{1}{2}$ in. above the external angular process of the orbit, and $1\frac{3}{4}$ in. from the median line. The antitoxin recommended for use in the intracerebral treatment of tetanus is known as "double strength"—that is, 10 cc. of the antitetanic serum are evaporated to dryness, and the resulting "dried antitoxin" preserved in sterile, hermetically sealed bottles. When required for use the contents of one bottle are dissolved in 5 cc. of sterile water, care being observed to avoid contamination. This quantity is administered at one time. In addition to the intracerebral injection, 20 cc. of antitoxin should be administered subcutaneously or intravenously for a few days. The object of this is to neutralize any tetanus-toxin that may be circulating in the blood, and thus prevent further poisoning of the nervous system.

Antistreptococcic Serum.—Although the number of cases of septic infection that have been treated with antistreptococcic serum is already very large, it is still too soon to estimate accurately the therapeutic value of the remedy. Cotton² presents a critical review of the literature relating to the use of antistreptococcic serum in the treatment of sepsis. After noting the difficulties in the way of drawing just conclusions, he summarizes as follows: The mortality (32.3%) cannot be called low, even granting that the series includes many desperate cases. It is perhaps not fair to compare this with any ordinary series of cases of puerperal sepsis, but certainly on such figures as a basis there can be no claim of any considerable reduction of mortality. In individual cases the use of the serum would seem to have helped definitely; but these are more than counterbalanced by cases of streptococcus-infection alone, in which no effect whatever is to be attributed to the serum. The irregularity of course in puerperal fever, the difficulty of distinguishing the results of other treatment from those of serum, cannot be too clearly borne in mind. In a proportion of cases, however, there does appear, apparently as a definite result, a marked improvement in the subjective condition. This is by no means constant, and apparently bears little, if any, relation to the general course of the infection; but it seems definite and must mean something. This seems reason enough to give the serum further trial—as a symptomatic treatment, if no more. There seems to be no good reason against its use. Urticaria, erythema, joint-pains, etc. are of not uncommon occurrence, but of no great moment. Abscesses at the point of injection, sometimes containing streptococci, are not rare, and suggest care in using a bacteriologically tested serum. Probably in many cases the dosage has been too small. The potency of different makes of serum varies, and they seem to lose notably by keeping. While there are no accurate data for dosage in man, yet the problem is not to protect against an infection, but to cope with an infection in full swing, and that with a serum of doubtful efficacy; the needed dose will probably be large if anything is to be accomplished. The limit of dosage must vary, but the untoward effects noted above are not frequent, and numbers of cases have borne 25-cc. doses. There seems, then, some reason for continuing

¹ N. Y. Med. Jour., Dec. 17, 1898.

² Boston M. and S. Jour., Feb. 2, 1899.

the use of the serum in cases of demonstrated streptococcus-infection; care is needful in selecting the serum to be used; it should be used, if at all, in considerable amount; and, above all, until more evidence of its efficacy is forthcoming, it should be used as an adjunct only, and never to supplant or modify other treatment of the case. In discussing the paper, Pratt stated that the results in puerperal septicemia treated with antistreptococcic serum have been as follows: Cases, 118; recoveries, 76; deaths, 41; percentage of recoveries, 64.4; percentage of deaths, 35.5. Of course, the cases of most value are those in which streptococci were demonstrated in the uterine discharge. Of the 11 cases reported since January 1, 5 recovered and 6 were fatal, a mortality of 54.5%. In 38 cases in which streptococci were not demonstrated there were 7 deaths—18.4%.

In a discussion before the Surgical Society of Brussels,¹ different members gave the following summary of their opinions on the treatment of infection by antistreptococcic serum: Dandois said: "Those results alone are considered when recovery takes place after injections of the serum; but the cases are not considered in which the effects are not notable or in which death occurs; and in cases in which the patient recovers, it is not considered whether or not he would have recovered of himself if left without treatment." Willems said: "For my part, my experience is insufficient to judge from; but in cases of grave infection I would employ the injections and make a bacteriologic examination later, stopping the use of the serum if the case did not show the streptococcus. If they were found, I would continue the injections as the most reliable means we now have of combating their effects." Debersaqués expressed the following opinion: "I have obtained marked results by injecting about the erysipelatous area. In cases of general infection the serum is an adjuvant, but surgical treatment loses none of its indications nevertheless." Lambotte reported 10 cases, and said: "Although bacteriologic examination was wanting in many of my cases, the results seem to point to the conclusion that the serum is more efficacious the earlier it is applied. It should, I believe, be used as a preventive where infection after operation is suspected." Baum,² from his own experience and a study of the literature bearing on the subject, concludes that in cases of pure streptococcus-infection the serum undoubtedly exercises a favorable influence on the course of the disease. In cases of mixed infection the influence of the serum has been demonstrated, but further trial of the remedy as an adjunct to other treatment is desirable. Considering the grave character of complications of nonstreptococcic origin, all indicated therapeutic measures should be employed in addition to the serum. It may be assumed that the serum exerts a direct bactericidal action upon the streptococci, and not merely a stimulating influence on phagocytosis. The initial dose should be 20 cc., to be followed by 10 or 15 cc. every 24 hours, according to the indications.

C. P. Thomas³ states that he has treated successfully 15 cases of acute sepsis with Marmorek's antistreptococcic serum, and refers to 8 cases previously published by him in Dec., 1898. He thinks the commencing dose should be 30 cc.

¹ Ann. de la Soc. Belge de Chir., No. 9, 1899.

² Medicine, Jan., 1899.

³ Jour. Am. Med. Assoc., Feb. 18, 1899.

On the other hand, it must be said that there are a number of observers (Mundé, Cobbett, Parks, Jewett, Cheyne) who are extremely doubtful as regards the utility of antistreptococcic serum in general sepsis, and who believe that considerable caution should be exercised in its administration. At a meeting of the American Gynecological Society, held May 24, 1899, a committee, appointed for the purpose of investigating the claims of the serum-treatment of sepsis, reported, after an exhaustive study of the recorded cases, that the serum-treatment of puerperal sepsis is not to be relied upon, and needs further laboratory investigation before it may be recommended for general use.

Bruce¹ reports 2 cases of **septic infection** in which he successfully employed antistreptococcic serum. He concludes: 1. That we may confidently look for success with antistreptococcic serum in a considerable number of cases of septicemia. 2. That the favorable effects, if any, are produced with remarkable rapidity. 3. That the serum may succeed where other remedies had failed. 4. That success might possibly attend one kind of serum after another kind had proved useless.

McNab² refers to 2 cases of **epidemic cerebrospinal fever** in which he employed antistreptococcic serum. One, a severe case with complete unconsciousness, shallow, irregular breathing, and involuntary discharges from the bowels and bladder, made a slow but satisfactory recovery. The other, a fulminating case, seemed to improve, but terminated in death on the third day after treatment was instituted. He says that if the results were merely coincidental, they were entirely unlike anything he had ever before experienced in cases of that kind.

Lindsay,³ finding that death in smallpox most often occurs about 5 days after the pustules have dried and have begun to be absorbed, believes that the fatal termination should be attributed largely to a **reinforcement of the specific virus of variola** with pyogenic toxins. In consequence he employed antistreptococcic serum in 6 patients who, from analogy, might have been expected to die, all exhibiting confluence early in the pustular stage. No more than 3 injections were given in a single case. As a result of the treatment the intensity of the toxemia was lessened, and convalescence began sooner and was more rapid. None of the 4 patients recovering developed abscesses, arthritis, or hyperpyrexia.

André⁴ reports 5 cases of **facial erysipelas** in which he used Marmorek's serum. Complete and final decline of temperature to normal was observed save after 1 injection. He believes that the injections should be repeated at 48-hour intervals. That the erysipelas may continue its evolution while the temperature remains normal was demonstrated in one instance, when, although the temperature fell, the cutaneous signs persisted for several days.

Robinson⁵ has employed antistreptococcic serum successfully in 2 very grave cases of erysipelas. Bristow⁶ reports 14 cases of erysipelas in which the serum was administered, and concludes from these observations (1) that cases of idiopathic erysipelas may be quickly controlled by

¹ Lancet, Aug. 20, 1898.

² N. Y. Med. Jour., vol. xix., p. 262.

³ Brit. Med. Jour., No. 2002, 1899.

⁴ Arch. de Méd. et de Pharm. mil., No. 11, 1898.

⁵ Jour. Am. Med. Assoc., Dec. 24, 1898.

⁶ Phila. Med. Jour., vol. iii., No. 6.

the serum, giving rarely more than 2 injections of 10 cc. each; and (2) that in phlegmonous inflammations the serum does nothing more than check the extension of the process.

Antistaphylococcic Serum.—Moritz,¹ recognizing the fact that the mortality of malignant endocarditis is at least 80%, determined to try the effect of antistaphylococcic serum in a typical case of that disease. On 6 occasions 5 cc. of the serum were employed, after which the acute symptoms entirely disappeared. It was noticed that after each injection there was improvement in the temperature.

Antivenomous Serum.—Semple and Lamb² conclude from experiments that 15,432 gr. of antivenomous serum will neutralize 0.015432 gr. of cobra-venom, and therefore 225 gr. of serum would be required for this amount of venom. When snake-bite is treated soon after it occurs with an intravenous injection of antivenomous serum, the authors show that the result is the same as that obtained in the laboratory. Disregarding cases in which death occurs very rapidly (probably from the entrance of venom directly into a vein), death usually occurs after several hours. During the interval the poison is gradually absorbed. If 225 gr. or more of antivenomous serum are introduced into the blood before the lapse of such time as is required for the absorption of a lethal dose of venom, recovery should take place.

Apocynum Cannabinum.—A paper by Dabney,³ recording his experience with *Apocynum cannabinum* in dropsical affections, has served to revive interest in this drug, which was in danger of falling into disuse on account of the substitution of other plants totally dissimilar, but also known under the common name of milkweed. Dabney reports 16 cases of chronic disease of the heart and kidney associated with dropsy in which *Apocynum cannabinum* proved the most efficient remedy. He claims for the drug the following advantages: 1. The small quantity necessary to produce free diuresis, emesis, or catharsis. 2. Its pleasant aromatic taste. 3. Its fine tonic properties, which compensate for the depression consequent on free catharsis. 4. Its harmlessness—an overdose being speedily followed by free emesis. Turner⁴ and Meek⁵ also have found the drug of great value in many cases of renal and cardiac dropsy. [*Apocynum cannabinum* has been in use for at least 60 years. Experiments conducted by Bradford, Ringer, Sokoloff, and quite recently by Petturuti and Somma,⁶ indicate that it slows the heart, raises the blood-pressure, and increases the urine. Its diuretic action appears to be due to increase in the blood-pressure, and not to a direct stimulation of the renal epithelium. Large doses produce vomiting and purging. The tincture seems to be the most eligible preparation, and least apt to excite gastrointestinal irritation. The dose is about 20 drops, twice daily. *Apocynum cannabinum* is without doubt a useful substitute for digitalis in certain cases of cardiac and renal dropsy.]

Apomorphin.—Babcock⁷ calls attention to the fact that patients can tolerate very much larger doses of apomorphin than is commonly supposed, and by the mouth as much as 2 gr. at a single dose may be given with-

¹ St. Petersburg. med. Woch., No. 19, 1898.

³ Therap. Gaz., Nov. 15, 1898.

⁵ Ibid., Oct. 15, 1898.

² Brit. Med. Jour., No. 1996, 1899.

⁴ Ibid., Dec. 15, 1898.

⁶ Il Policlinico, Nos. 10-14, 1899.

⁷ Am. Medico-Surg. Bull., June 10, 1898.

out nauseating. It is more likely to cause emesis when taken in the morning before breakfast. On account of its satisfactory effects, and the ease with which it is administered in pill or capsule, when for any reason it is not desirable to prescribe a syrup, it has become a favorite remedy with Babcock in the treatment of both acute and chronic bronchitis. Combined with codein or morphin, troublesome cough may be allayed without at the same time arresting bronchial secretion; indeed, the sputum will be increased, while at the same time the cough is alleviated. The dose usually recommended by the author is $\frac{1}{5}$ or $\frac{1}{4}$ gr. up to $\frac{1}{2}$ and sometimes to 1 gr. every 3 or 4 hours. Special attention is drawn to the necessity of using a pure preparation, as soporific effects are sometimes induced by the morphin in impure specimens. The drug must not be prescribed in mixtures containing potassium iodid. [Attention should be called to the fact that the drug is somewhat rapidly eliminated, and the doses should follow each other at intervals of 2 hours. The characteristic effect is a watery expectoration, seeming rather to drain the edematous and congested bronchial mucous membrane than to stimulate its muciparous glands to activity. Naturally it is contraindicated in all bronchorrheas.]

Argonin.—This is an organic preparation of silver nitrate made by mixing the latter with a combination of sodium and casein. It has been found to be a very efficient bactericide, especially in gonorrhea and gonorrheal ophthalmia. Its disadvantages are its difficulty of solution and the ease with which it decomposes. Jellink,¹ however, describes a new preparation, called argonin-L, which contains 10% of silver instead of 4.2%, which is readily soluble in cold water, and which can be kept in solution for several months without decomposing. [The especial value of this silver salt lies in its bland action.]

Arsenic Iodid.—Saint-Philippe² highly recommends arsenic iodid for a class of cases in which what he terms lymphatism and serofulosis are underlying causes. He mentions the following: In dermatitis, either moist or crusted, when the lesion has passed its most acute stage; in obstinate ophthalmia, with either phlyctenular keratitis or ulceration; in coryza, with swollen nose and enlarged and ulcerated lips; in recurring bronchitis, with emphysema and violent crisis of pseudoasthma, in which the mediastinal lymph-glands are certainly enlarged; in fetid diarrhea, and in abdominal distention in which dyspepsia plays an important role. He employs the anhydrous iodid in aqueous solution, in the strength of 1:100. Of this solution 5 to 30 drops a day may be given in water or milk before meals. The commencing dose should be small. The solution is generally well tolerated. Anorexia or slight diarrhea calls for its temporary suspension.

Asaprol.—This is a calcium salt of the sulphuric ether of beta-naphthol, and has been used chiefly as an antiseptic and as an antirheumatic remedy. Dujardin-Beaumetz and others have extolled it as a rival of sodium salicylate in rheumatism; but this claim for it has never been substantiated. Ferreira³ claims to have observed beneficial effects from its use as an intestinal antiseptic in 6 cases of typhoid fever. From 30 to 45 gr. were given each day, either in solution or cachets, every 2

¹ Wien. med. Woch., No. 5, 1899. ² Ann. de Méd. et Chir. Infant., Aug. 15, 1898.

³ Bull. gén. de Thérap., tome cxxvi, 1898.

hours. [This remedy was studied in 1893 by R. W. Wilcox,¹ who found it fairly efficient in acute polyarticular rheumatism, especially when the salicylates were not tolerated. Moncorva has employed it for various conditions with much success. It is certainly nontoxic, which is more than can be said of some remedies of its class.]

Aspidium Spinulosum.—Lauréu² recommends an ethereal extract made from the rhizome of this plant as an efficacious remedy, in doses of 1 dram, for tapeworm. In an instance reported, 2 hours after administration castor-oil was exhibited, and $1\frac{1}{2}$ hours thereafter the head and 25 feet of a *Bothriocephalus latus* were expelled. Success followed its use in other instances. The substitution of this for the official *aspidium* is recommended when the plant is more plentiful.

Belladonna.—Coutts³ calls attention again to the value of large doses of this drug in the bronchopneumonia of childhood. The free secretion into the bronchi and pulmonary tissues is markedly diminished. Of several dozen patients so treated, only 2 died. After a few doses of the drug the severe dyspnea is relieved and a marked change for the better ensues. The writer lays stress on 2 points: 1. The dose should be large. 2. The extract should be used in preference to the tincture, as the latter is unreliable. The dose is $\frac{1}{4}$ gr. every 3 or 4 hours, both to infants and older children. Erythema and mydriasis are sometimes present. Slight delirium occurred in several instances, but was remedied by lessening the dose. [The improvement of the circulation should also be included in the argument for the use of this drug.]

Blaud's Pills.—England⁴ finds that there is a radical difference between the official formula and the original Blaud formula. In the former, crystallized ferrous sulphate is directed, and enough potassium carbonate to convert it into carbonate; in the latter, exsiccated ferrous sulphate is employed, and an excess of potassium carbonate is in the finished product. He believes that the free alkali in the original Blaud's pills was of value in aiding in the absorption of the iron salt, and that it was a mistake to eliminate it from the official formula. The following formula for Blaud's pills, which contains the free alkali and which has been found most satisfactory, is recommended: Mass of ferrous carbonate, 36 gr.; potassium sulphate, 24 gr.; potassium carbonate, 48 gr.; powdered althea, 1 gr.; powdered acacia, sufficient. Make into 12 pills and enclose in No. 4 gelatin capsules.

Bone-marrow.—Fowler⁵ has made a series of experiments with the view of discovering experimentally whether bone-marrow has any direct effect on the blood in anemia. Four young rabbits were taken from the same litter, and one fed on a diet poor in iron, one on a diet poor in both iron and proteid, a third on a diet poor in proteid, but containing a sufficiency of organic iron, while the fourth was kept on ordinary food. It was found that while all 3 defective diets produced anemia, the greatest fall in hemoglobin took place when the iron was deficient, and the greatest fall in corpuscles when the proteid was deficient, the exclusively carbohydrate diet producing the greatest alterations in the blood. This diet, therefore, was selected as most likely to give

¹ Epitome of Medicine.

² Therap. Monats-h., Heft 4, S. 211, 1899.

³ Brit. Med. Jour., No. 1987, 1899.

⁴ Phila. Med. Jour., Jan. 28, 1899.

⁵ Scottish M. and S. Jour., Sept., 1899.

results comparable with what happens in anemia occurring in man. An extract of perfectly fresh marrow was made by grinding with normal salt solution and filtering. This was then injected into the peritoneal cavity or beneath the skin. The results of the experiments, 11 in all, were as follows: 1. Subcutaneous injections of bone-marrow have no action on the red corpuscles or hemoglobin of a healthy animal. 2. When the red corpuscles and hemoglobin fall below their normal limits, injections of marrow produce a decided rise in both; this rise is well marked, sudden, and of short duration. 3. Along with the increase in the red corpuscles there is no corresponding improvement in the form of the cells. 4. The active principle is present in the aqueous, but not in an alcoholic extract of marrow, it is not precipitated by boiling, it does not contain iron, and may possibly be a deuteroproteose.

Bromoform.—While further experience serves to establish more securely the reputation of bromoform in the treatment of pertussis, it also shows that the drug is not altogether free from dangerous properties. Müller¹ reports a fatal case of poisoning from bromoform, and states that 12 other cases of poisoning have been published. Since the appearance of Müller's paper other instances of bromoform-poisoning have been recorded by Burton-Fanning² and Evans.³ In many of these cases the trouble has been with the dose, and not with the drug itself. Thus, in Müller's case a child of 2 years was given 90 minims by mistake. In other instances a lack of familiarity with the physical peculiarities of the drug have led to the accident. As bromoform is heavier than either water or mucilage, its suspension in the latter can only be temporary, and failure to shake the bottle before each administration may lead to serious consequences. The bromoform naturally tends to fall to the bottom of the containing vessel; and unless this is prevented by frequent and thorough agitation, a much larger dose of the drug is apt to be taken on emptying the bottle than was intended.

Calcium Chlorid.—Hare⁴ calls attention to the value of calcium chlorid in the treatment of small, oozing hemorrhages. Wright of Netley, England, as is well known, pointed out some years ago that the use of calcium chlorid distinctly increases the coagulability of the blood; but he also pointed out a fact which must not be forgotten—namely, that after the drug is given in full dose for a number of days a reverse effect is produced. Its use, therefore, should not be persisted in for too long a time. The hope that calcium chlorid might prove of value as a substitute for potassium iodid in the treatment of aneurysm has not been fulfilled. The fact that cases of prurigo are frequently attended with erythematous or urticarial exudations led Wright to infer that there was a tendency in the blood in such cases to exudation, and therefore to increased fluidity. Consequently, whatever would increase the coagulability might, he thought, relieve the troublesome itching. The favorable results attending his first few cases induced him to try it more extensively, and in almost every case, we are told, the effect was very striking. Since 1896, when the remedy was first suggested, it has been used by many observers in a variety of skin-diseases associated with itching, the results being quite variable. [The question of dose is quite important; 40 to 60

¹ Münch. med. Woch., No. 38, 1898.

² Lancet, Jan. 21, 1899.

³ Ibid., Jan. 14, 1899.

⁴ Columbus Med. Jour., Aug. 29, 1898.

gr. daily for 2 days are generally sufficient. The effect on the blood seems to persist after the remedy is discontinued.]

Cantharides.—Salinger¹ claims for this drug curative as well as diuretic powers in chronic parenchymatous nephritis; 1 or 2 minims of the tincture are recommended. This amount added to $\frac{1}{2}$ oz. of iron and ammonium acetate makes a satisfactory prescription. In 2 cases dropsy and marked oliguria were speedily benefited. [Even larger doses may be employed without producing strangury. Its use in chronic pyelitis, cystitis, and urethritis merits further study in view of the good results frequently obtained.]

Carbolic Acid.—Powell,² at a meeting of the Medical Society of the County of New York, called attention to the value of 95% alcohol as an antidote to carbolic acid. He demonstrated before the society that a 95% solution of the best crystallized carbolic acid could be rubbed freely on the hands, and allowed to remain for a few seconds without any unpleasant effects, if the hands were then rinsed with alcohol. He said that he knew of 3 cases of carbolic-acid poisoning in which alcohol had been used successfully internally. In the same communication Powell stated that he had obtained excellent results in mammary, palmar, ischio-rectal, and tuberculous abscesses by using carbolic-acid solution of the strength of $\frac{1}{2}$ dram to the ounce, and subsequently washing out the abscess-cavity with alcohol. His method is to open the abscess through an incision only large enough to empty it completely. The cavity must be thoroughly cleared out by irrigation, swabbing, or curetting. After this has been done it should be filled with the strong carbolic-acid solution, and the acid evacuated; then filled with alcohol, and the alcohol evacuated. Phelps, in discussing the paper, said that he had verified in his own practice almost every claim made by Powell.

Ascoli³ cites 35 cases of tetanus treated by the hypodermic injection of carbolic acid. Of these only 1 died. The method of treating tetanus by carbolic acid, known also as Baccelli's method, consists in the administration subcutaneously of a 2% solution of carbolic acid, given at 2 or 3 hours' intervals. The initial dose in cases of average severity is about 3 gr. a day, and this amount is rapidly increased to 6 or 8 gr. a day. The danger of poisoning by carbolic acid is apparently greatly reduced by tetanus. Ascoli sums up his conclusions as follows: 1. Statistics show better results from carbolic acid than from the use of serum. 2. The carbolic acid must be given hypodermically and in large doses. 3. Under its influence the spasms decrease in a marked degree. 4. The acid acts in tetanus as an antitoxic and as a moderator of the reflex activity of the nerve-centers. 5. The energetic local disinfection, combined with the support of the patient's strength, is the cardinal point in the treatment of tetanus. 6. Serum-treatment is useful as a preventive, and also in the developed disease, when it is possible to apply it early or when the production of toxins is still going on. But the results of this method are not brilliant. 7. A patient suffering from tetanus must be treated eclectically, regard being had to the wound, to the intensity of the intoxication and its duration, and to the special conditions present in the case. [Success in antidoting carbolic acid taken internally depends

¹ Therap. Gaz., vol. xxiii., 1899.

² Med. Rec., Mar. 11, 1899.

³ Bull. della R. Accad. Med. di Roma, Anno xxiv., fasc. iv., 1897-98.

upon the time which has elapsed and the strength of the alcohol. When alcohol of proper strength is brought in contact with the acid it is completely neutralized so far as its caustic properties are concerned.]

Chelidonium Majus.—Freudenberg¹ reports the results of his experiments with this remedy in uterine cancer. He employed tampons saturated with a 50% solution of the extract. The applications were made daily or every other day, and were painless. While in no sense curative, the remedy seemed to have a decided palliative effect. Winter and Schmidt² report 14 cases of inoperable carcinoma treated with chelidonium. About 20 minims of the aqueous extract were injected subcutaneously into the abdominal wall, and $\frac{1}{2}$ to 1 dram was given by the mouth daily. The digestion seemed to improve, but no influence on the progress of the disease was observed. [Within the past 2 years the favorable opinions as to the benefit of this drug in inoperable cancers have become less emphatic, and whatever good may have been obtained was probably due to its local irritant effects.]

Chlorin.—Wilcox³ calls attention to the efficacy of chlorin in the treatment of typhoid fever. He contends that there is in medicine nothing more striking than the clearing up of the tongue, the improved mental condition, the lessened local disturbances, and the general betterment which chlorin brings about when administered to those patients presenting the severer forms of the disease.

Cholin.—This is an alkaloidal substance of wide distribution occurring in the human body in both normal and diseased conditions. It was formerly thought to be identical with neurin, but Brieger has shown the falsity of this view. From an elaborate study of its pharmacologic action, H. C. Wood, Jr.,⁴ draws the following conclusions: 1. Cholin paralyzes in the frog the peripheral endings of the motor nerves, and finally also the muscle-substance. 2. It has only very feeble action on the spinal cord or the brain. 3. It stimulates the salivary, lacrimal, gastric, and probably all other true glands. 4. It does not stimulate the biliary secretion. 5. It causes violent intestinal peristalsis. 6. It first stimulates, then paralyzes, the vasomotor center in the medulla. 7. In the mammal it stimulates the peripheral cardiac inhibitory apparatus; any action on the cardiac muscle is very slight. 8. It paralyzes the respiratory center. 9. It is rapidly eliminated, and probably at least partially by the kidneys. 10. It differs from muscarin in its physiologic action, especially in regard to the heart and respiration. From neurin also it is to be distinguished principally by its action on the peripheral nerves.

Cimicifuga.—Robin and Mendel⁵ have obtained good results from cimicifuga in tinnitus aurium. The effects were noted in 3 days. Bishop⁶ also recommends cimicifuga for noises in the ear, and states that the drug is especially useful in the tinnitus accompanying hypertrophic otitis media. The dose is 20 to 30 drops daily.

Cinnamic Acid.—Landerer,⁷ after using cinnamic acid for more than 8 years in the treatment of phthisis, has reached the conclusion that the drug has distinct curative properties when used early in the disease.

¹ Centralbl. f. Gynäk., No. 30, 1897.

² Ibid.

³ Med. News, Feb. 11, 1899.

⁴ Phila. Monthly Med. Jour., July, 1899.

⁵ Therapist, Feb. 15, 1899.

⁶ N. Am. Pract., Jan., 1899.

⁷ Presse méd., Jan. 7, 1899.

Acute cases were not affected, but several chronic cases with cavities were apparently cured. Apart from its antiseptic action, cinnamic acid has the property of producing in tuberculous subjects a marked hyperleukocytosis. In 17 cases of intestinal tuberculosis the results were remarkable. The author recommends the intravenous injection every 48 hours of sodium cinnamate in normal salt solution. The doses should be gradually increased from 1 to 25 mg. The treatment should continue for 4 to 6 months, and then be suspended for 1 month.

Lovtsky¹ has used sodium cinnamate hypodermically in 8 cases of phthisis, with results fully conforming to those obtained by Landerer. Mann² also bears testimony to the good effects of this treatment in pulmonary tuberculosis. [To the hyperleukocytosis probably may be attributed the good results obtained, and this is brought about by many volatile oils, possibly equally well by those containing other acids than cinnamic. The subject is deserving of further investigation.]

Cocain.—Schiffers³ is of the opinion that the variation in the susceptibility of different persons, and of the same person on different occasions, to cocain is sometimes due to acidity of the solution employed or to the acidity of the mucous membrane. He contends that if these conditions are present an alkali will neutralize the acidity and will render the cocain effective in much smaller doses. He recommends the use of fresh cocain solutions only; if these were acid he would neutralize them with a minute quantity of sodium bicarbonate. Bronner⁴ finds that for operations on the eye cocain in crystals is far preferable to the ordinary solutions. As the crystals cause severe smarting, he uses a few drops of a 2.5% solution first, and then lays about $\frac{1}{4}$ gr. of crystallized cocain on the part of the globe to be incised. After a few seconds of such contact the eyes are closed 4 or 5 minutes, and they are then ready for operation.

Brennen⁵ concludes from the successful treatment of a case of cocain-poisoning and from a comparison of the physiologic action of the 2 drugs that morphin is the physiologic antidote of cocain.

Coronilla Varia.—Poulet⁶ asserts that this drug may be used advantageously as a succedaneum for digitalis in cardiac disease. He believes that it is superior to digitalis in not disturbing the digestive functions and in being noncumulative, but that it is inferior to digitalis as a diuretic. In this last respect, however, he claims that coronilla is more reliable than spartein or strophanthus. In his experiments the writer employed an aqueous extract and a powder of the fresh plant, the latter being given in doses of $1\frac{1}{2}$ gr. In 1884 Schlagdenhauffen and Reeb isolated a glucosid—coronillin—from coronilla, and the action of this substance has been carefully studied by Maramaldi, who finds that it first stimulates the heart and slows the pulse, and then depresses the heart and quickens the pulse, and finally causes death from cardiac paralysis. According to the author, coronillin is unreliable in heart-disease, since it is broken up by the acid of the stomach into glucose and coronillein. Coronillein has not the action of coronillin, and the latter

¹ Vrach, vol. xx., No. 1.

² Med. Rec., Feb. 4, 1899.

³ Ann. des Mal. de l'Oreille et du Larynx, Feb., 1899.

⁴ Brit. Med. Jour., Aug. 20, 1898.

⁵ N. Y. Med. Jour., Nov. 19, 1898.

⁶ Nouveaux Remèdes, No. 13, 1898.

cannot be given hypodermically on account of its extremely irritating properties.

Cosaprin.—This substance is a sulphoderivative of acetanilid, and has been employed in 60 instances by Schudmak¹ without the super-vention of untoward symptoms. It is recommended as an antipyretic and antirheumatic remedy, free from deleterious action on the respiration, circulation, and blood. It has an advantage over acetanilid in being very soluble in water. It may be given in sweetened water or as a powder, in doses of 5 to 8 gr., thrice daily. Its effect on temperature is said not to be lasting, the previous high temperature being again reached in 2 or 3 hours.

Creasote.—Creasote has lost some of its old-time reputation in the treatment of phthisis, but a more thorough appreciation of its drawbacks has led to the introduction by pharmaceutic chemists of a great number of derivatives which have more or less advantage over the crude drug. A derivative of creasote which has been extensively used during the past year is **creasotal**, a liquid compound representing the carbonate of the various substances found in creasote. A report on the results obtained with creasotal in von Leyden's clinic has been published in the *Charité Annalen*.² The conclusions arrived at by the experiments made under the direction of the chief surgeons of this clinic show that the remedial effect of the drug is not a merely symptomatic, but a specific, one. After the administration of creasote, it has always been noticed that the appetite disappeared and symptoms of gastrointestinal disturbance soon followed. Creasotal was free from these noxious by-effects. The following mode of administration was adopted: Each patient began with 5 drops 3 times daily, increasing the dose 3 drops every day until 25 drops were taken at a dose. At this they were kept for from 1 to 4 weeks—in some cases even for several months; then the dose was diminished in a similar ratio until only 10 drops were taken thrice daily, when the ascending scale was begun again. Under the treatment the general condition of the patients was markedly improved: fever, night-sweats, and all the bad symptoms disappearing after 6 weeks of treatment.

Wainwright³ speaks favorably of creasote valerianate (**eosot**) in phthisis. He recommends a mixture of eosot, 5 drams; alcohol, 10 drams; and oil of peppermint, 10 drops. Each tablespoonful of the mixture contains about 12 minims of eosot. He advises that 1 to 3 drams be mixed with plenty of milk and taken in 3 equal parts daily.

Boureaux⁴ has published a monograph on the combination of creasote with phosphoric acid (**creasote phosphate**), which appears a reliable preparation. [Considering the difficulties of administration of beechwood creasote even when pure, one is surprised that the more eligible and equally efficacious substitutes have not been more generally adopted. The extension of the carbonate to acute respiratory diseases promises to be a decided advance in their treatment.]

Digitalin.—Beates⁵ contends that truly wonderful results are sometimes brought about by the continuous use of digitalin (German, Merck) in the vasomotor and cardiac lesions of senility. He asserts that several

¹ Klin.-therap. Woch., No. 2, 1899.

³ Jour. Am. Med. Assoc., Oct. 8, 1898.

² Ephemeris, Jan., 1899.

⁴ Ephemeris, 1899.

⁵ Jour. Am. Med. Assoc., Oct. 1, 1899.

patients, who years ago had reached a stage of threatened dissolution, were able to be about as old, but comfortable, seniles. The dose recommended is from $\frac{1}{10}$ to $\frac{1}{2}$ gr., from 3 to 6 times daily, as the severity of the case requires. If instances of advanced disease are encountered, and dissolution threatens when first seen, $\frac{1}{2}$ gr. is safely exhibited hypodermically, and repeated in 1 hour; after that 2 gr. additional are administered by mouth, in $\frac{1}{4}$ -gr. doses every 2 hours, should the emergency require. This bold plan has, in Beates's experience, several times averted impending death and rendered restoration possible. When the circulation has been restored by 2 or 3 days' treatment, the advantage is maintained by just sufficient of the remedy to secure permanent results. [This paper is in decided contrast to the usually accepted opinion as to the propriety of administering digitalis or its glucosids to aged individuals who are presumably suffering from arterial degenerations.]

Dionin.—This compound is the hydrochlorid of the mono-ethyl-ester of morphin, and appears as a fine, white, crystalline powder, freely soluble in water. Korte¹ has found it especially useful in asthma and in the irritable cough of phthisis and bronchitis. In phthisis a dose at bedtime gives great relief, and generally secures a good night's rest. Unlike morphin, it is said not to disturb digestion nor to cause headache. As a narcotic, it probably stands midway in efficiency between morphin and codein. As an analgesic, it is not so active as morphin. Korte recommends the following formula: Dionin, 8 gr.; syrup, $3\frac{1}{2}$ oz. A teaspoonful at bedtime. Fromme² speaks highly of dionin in the treatment of the morphin-habit. [From the patient's standpoint, one preparation of morphin when substituted for another might be a pleasant treatment.]

Eucain-B.—This anesthetic, which is said to be nearly 4 times less toxic than cocain, has steadily grown in favor since it was first recommended by Vinci, in 1897. According to Marshall,³ its advantages over cocain for ophthalmic work are: its lesser toxicity, its inactivity as regards the pupil and accommodation, its antiseptic action, and the greater stability of its solutions. It is said not to dry the cornea; and, instead of anemia, hyperemia of the conjunctiva occurs. It possesses a slight irritant action, which, however, soon disappears. A 2% solution dropped into the eye produces anesthesia in from 1 to 3 minutes. This lasts from 8 to 15 minutes. Somers⁴ finds that eucain-B in 3% solution produces as complete anesthesia of the nasal mucous membrane as does a 4% solution of cocain. It is less toxic, more prompt in action, and less irritating than eucain-A. As it has no apparent shrinking action on the turbinal investiture, as has cocain, it is therefore less valuable for nasal surgery. According to Reclus,⁵ solutions of eucain-B are stable and permanent, and can be heated even to boiling, thus permitting perfect sterilization. Cipriani⁶ has found it useful in general surgery in solutions varying in strength from 2% to 6%. Legrand⁷ also speaks well of it as a local anesthetic, but claims that in inflamed tissues the results are as uncertain as from cocain.

¹ Therap. Monatsch., Jan., 1899.

² Berlin. klin. Woch., Apr. 3, 1899.

³ Practitioner, Sept., 1898.

⁴ Therap. Gaz., quoted by Ephemeris, 1899.

⁵ Bull. méd., No. 26, 1898.

⁶ Therap. Monatsch., Heft 6, S. 331, 1898.

⁷ Nouveaux Remèdes, No. 11, 1898.

Filix Mas.—Boehm¹ concludes that the value of this drug depends on the presence of aspidin as well as filicie acid. Of 11 preparations, 6 contained aspidin in large proportion, while filicie acid was absent; 4 contained filicie acid, but no aspidin; and 1 contained small quantities of both. From an experience of many years he is of the opinion that an oleoresin rich in aspidin is preferable to one rich in filicie acid. He claims that everything points to the habitat and conditions of growth, as also the many varieties of the plant, as the principal influence in the formation of aspidin or filicie acid.

Sidler-Huguenin² has collected 78 cases of poisoning by Filix mas. Of these patients, 12 died, and 18 suffered from permanent blindness either in one or both eyes. The lesion of the eye was atrophy of the optic nerve. These figures are sufficient to convince any one of the danger attending the administration of large doses of this drug. The administration of castor oil in connection with Filix mas, it is noteworthy, seems to increase its toxicity. Some saline should be given if a laxative is necessary. Special caution is necessary in the administration of this vermifuge to anemic or ill-nourished subjects. [The contraindication of castor oil with male fern cannot be too strongly emphasized.]

Formaldehyd.—The literature bearing on the value of formaldehyd or of formalin (a 40% solution of formaldehyd) as a general disinfectant is so voluminous that it is impossible to allude to more than a few of the most important communications. It seems well established that formalin is the best agent at our disposal for the disinfection of infected dwellings, household goods, etc. Park and Guérard,³ as the result of an exhaustive study made in the laboratories under the supervision of the Department of Health, City of New York, draw the following conclusions: Dwelling-houses may be superficially disinfected by means of formaldehyd gas, all apertures being tightly closed, when employed in the proportion of not less than 1% by volume strength, the time of exposure to be not less than 2 hours, and the temperature of the apartment not below 52° F. Under these conditions the common non-sporebearing pathogenic bacteria are destroyed. Sporebearing bacteria, such as anthrax-bacilli, are not thus destroyed; they require at least twice the volume of gas for their destruction. But these are of such rare occurrence that in house-disinfection they may practically be disregarded, and, if present, special measures can be taken to destroy them. The penetrative power of formaldehyd gas at ordinary room-temperature, even in double strength, is extremely limited. Articles, therefore, such as bedding, carpets, etc., should be subjected to steam, hot-air, or formaldehyd disinfection in special apparatus constructed for the purpose. For disinfecting bedding, clothing, etc., the gas should be used in the proportion of not less than 10% by volume strength, the exposure not being for less than 3 hours, and the temperature of the chamber not below 110° F. The aid of a partial vacuum greatly facilitates the operation. Upholstered furniture should be placed in a large room which can be heated to the required temperature. The most delicate colors and fabrics are unaffected by formaldehyd. Books cannot be satisfactorily disinfected in houses or

¹ *Sudd. Apoth. Zeit.*, quoted by *Therap. Gaz.*, Mar. 15, 1899.

² *Correspondenz-Bl. f. schw. Aertze*, Sept. 1, 1898.

³ *Phila. Med. Jour.*, Sept. 17, 1898.

libraries, or anywhere except in a special apparatus. Formaldehyd gas is superior to sulphur dioxid as a disinfectant for dwellings (1) because it is more efficient and rapid in its action ; (2) because it is less injurious in its effects on household goods ; (3) because it is less toxic to the higher forms of animal life ; (4) because when supplied from a generator placed outside of the room and watched by an attendant there is less danger of fire. Formaldehyd gas is the best disinfectant at present known for the disinfection of dwellings. It is inferior in penetrative power to steam or dry heat at 230° F.; but for the disinfection of fine wearing-apparel, furs, leather, books, etc., which are injured by great heat, it is better adapted than any other disinfectant.

Harrington¹ has made comparative tests of the various proprietary preparations recommended for use in spit-cups and bedpans. The test-objects employed were anthrax and typhoid cultures, stools from typhoid cases, membrane from diphtheria cases, and sputum from cases of pulmonary tuberculosis. Anthrax was employed solely on account of its high resistance, and not because of its common occurrence in habitations. The others were employed as representatives of the materials which the public is most commonly advised to sterilize without delay. Of all the agents tried, only 2, the preparation containing cresols and the 1 % solution of formaldehyd, made by diluting 2.5 cc. of 40 % formalin with 100 cc. of water, were uniformly successful. Moreover, the cost of the proprietary preparations is much in excess of that of very large numbers of those agents which yield the best results.

Murrell² gives the results of experiments which were made to determine the effect of certain essential oils and of formaldehyd on the growth of tubercle-bacilli and in the treatment of phthisis. The oils proved unsatisfactory, but the formaldehyd proved most satisfactory. A weak solution (6 %) of commercial formalin exerted a very marked retarding and inhibitive influence on the growth and development of the bacilli. The clinical results of the formaldehyd treatment were quite in accord with the results of the bacteriologic observations. A 6 % solution was, as a rule, employed. In most cases the drug was inhaled either once or twice daily, compressed air, by a simple mechanical arrangement, being made to bubble through the solution. In other cases, in hospital practice especially, the "bib" method was employed. The drug often caused irritation of the throat and coughing. Twenty cases of phthisis (many far advanced) were treated ; in 6 the results were inconclusive ; of the remaining 14 cases, 12 were much benefited, while 2 only slightly improved.

Hahn³ has obtained excellent results by the substitution of formalin for iodoform in glycerin in the treatment of tuberculous arthritis and tuberculous abscesses, and even tuberculous empyema. He employs 1 to 5 parts of a 35 % solution of formalin in 100 parts of glycerin, injecting into a joint, after it has been aspirated and washed out with boric-acid solution, one-third to one-half the amount of the formalin mixture that there was of pus before aspiration.

Mitchell⁴ succeeded in removing an inoperable sarcoma of the cheek by repeatedly applying a 1.5 % solution of formalin. The advantages

¹ Boston M. and S. Jour., May 11, 1899.

² Brit. Med. Jour., Jan. 28, 1899.

³ Centralbl. f. Chir., June 17, 1899.

⁴ Brit. Med. Jour., No. 1989, 1899.

claimed for this method are: 1. Simplicity; no anæsthetic required and no shock follows. 2. No suppuration ensues. 3. It is bloodless, and valuable in very vascular growths. 4. Great penetrating power; a "necropoietic" process with no discharge. 5. Safety if care be exercised. The objections are pain, which is severe, and edema; should the latter extend to the glottis a fatal result might follow.

Gerdeck¹ recommends formalin in sweating feet. The sole, but not the dorsum, should be painted with pure formalin 3 times a day, and the region between the toes once a day; 4 or 5 drops of the drug may also be applied to the shoe, as it serves to disguise the fetid odor as well as to preserve the leather. When the pure formalin cannot be tolerated a 30% solution may be employed. The good effects last 3 or 4 weeks, when the treatment may be repeated.

Gaultheria.—Luigi² has found injections of oil of gaultheria very useful in chorea, not only when rheumatism is an important factor, but when no history of this is obtainable. The amount employed was 2 drams daily. The author asserts that the oil is readily absorbed by the skin, and shows its presence in urine within 6 hours, without giving rise to any disturbance.

Gelatin.—The fact that gelatin has the property of increasing the coagulability of the blood has led several observers to try its effect in thoracic aneurysm and internal hemorrhage. Lancereaux³ has used subcutaneous injections of gelatin in several cases of aneurysm with very satisfactory results. In 2 cases of aortitis with dilated aorta, however, there was no amelioration of symptoms, and at the autopsy it was found there was no clotting of blood in the dilated portion of the artery. Lancereaux recommends a solution of 2 gm. of gelatin to 100 gm. of normal salt solution, of which 250 cc. should be injected into the subcutaneous cellular tissue of the thigh at intervals varying from 10 to 15 days. From 10 to 20 injections are usually sufficient. The gelatin should never be injected in the neighborhood of the aneurysm nor into the sac itself. The sacculated form of aneurysm is the only one suitable for the treatment. Huchard also obtained a successful result in a thoracic aneurysm, but found the treatment painful and not free from danger. He recommends a 1% solution of gelatin instead of the 2% solution recommended by Lancereaux. Fatal terminations following this treatment have occurred in 2 cases; one in the practice of Barth, the other in the practice of Boisset. The danger appears to be from too rapid coagulation and embolism.

Moyer,⁴ who has made a careful study of the literature relating to the gelatin treatment of aneurysms, draws the following conclusions: 1. Gelatin solutions are of some value in the treatment of sacular aneurysms. 2. They are of no value in diffused enlargements of a vessel. 3. The remedy is used empirically, the experimental work affording little or no basis for the treatment. 4. Solutions not stronger than 1% should be used. 5. Great care should be exercised in technique—failures in a sepsis are easily made, as the fluid is a good culture-medium; the solution should be kept in a brood-oven to determine bacterial growth. 6. There may be dangers in the treatment, but observations heretofore made are

¹ *Riforma Med.*, Nov. 15, 1898.

² *Ibid.*, No. 49, 1898.

³ *Lancet*, Oct. 22, 1898.

⁴ *Medicine*, Mar., 1899.

insufficient to indicate what they are. 7. Absolute rest in bed should be enjoined, and other remedies suitable for these cases may be given at the same time. 8. It is not a cure for aneurysm, but may rank in the future as a treatment. 9. The method is worthy of more extended trial.

Beck¹ observed marked improvement in a man with an aortic aneurysm eroding the sternum, and measuring $7\frac{1}{2}$ in. in diameter, from the administration of large doses of gelatin by the mouth. The size of the tumor was not affected, the pulsation and hoarseness almost disappeared, and the man was able to resume business. Gelatin has also been used with considerable success in checking internal hemorrhage. In Huchard's hands it proved very efficient in controlling a severe hemoptysis occurring in a patient with phthisis. Carnot² suggests the following solution for local use: Gelatin, 5 parts; calcium chlorid, 1 part; water, 100 parts. This may be sterilized by heat, but not at a temperature higher than 239° F., lest its solidification be interfered with. In internal hemorrhage and in hemophilia he recommends the internal administration of this mixture.

Guaiacetin is the name of a new compound formed by the action of chloroacetic acid on pyrocatechin. It appears as a white, odorless powder, which is freely soluble in water. It has been offered as a substitute for guaiacol in phthisis. Nied³ reports 6 cases of phthisis in which improvement followed the use of this drug.

Guaiacol.—The preparations of guaiacol continue to be extensively used in the treatment of phthisis and purulent bronchitis. Being, for the most part, free from disagreeable odor and taste, and less apt to disturb digestion than creasote, they have a distinct advantage over the latter drug in many cases. Wainwright⁴ speaks very highly of the **valerianates of guaiacol and creasote** in phthisis. He contends that these preparations meet all the requirements as remedies destructive to the disease without untoward effects. They increase the appetite and weight, and relieve cough, hectic, and night-sweats. The valerianic-acid component, he believes, by its sedative action on the nerve-centers, enables the patient to enjoy a sense of ease and comfort not secured by other remedies.

Phosphite of guaiacol (guaiacophosphal) has been recommended as a useful preparation, possessing a special advantage in the phosphorus which it contains. [See also Creasote, page 473.]

The potassium salt of guaiacol sulphonic acid has been introduced under the name of **thiocol**. This occurs as a fine white powder, of a slightly bitter taste and freely soluble in water. According to Rossbach,⁵ it is much more readily absorbed than all other creasote or guaiacol preparations. Even in concentrated solution he found that it was not caustic when applied to mucous membrane, and that in 20% aqueous solution it could be administered hypodermically without producing local irritation. Schwarz⁶ recommends thiocol in doses of 150 to 220 gr. a day in phthisis. He claims that it increases the appetite, lessens the cough, checks night-sweats, and lowers the temperature.

¹ Med. News, Dec. 3, 1899.

² Presse méd., No. 94, 1898.

³ Jour. Am. Med. Assoc., Oct. 8, 1898.

⁴ Therap. Monatsh., Heft 2, S. 96, 1899.

⁵ Klin.-therap. Woch., Heft 19, S. 716, 1898.

⁶ Ibid., Heft 13, 1898.

Acland¹ reports 2 cases of phthisis in which **guaiacolate of piperidin** acted favorably in checking night-sweats.

Heroin.—This substance, which is the diacetic ester of morphin, appears as a white, crystalline powder, of a slightly bitter taste. It is insoluble in water, but readily so in the presence of acids. Dreser² concludes from his experimental researches that heroin slows and deepens the respirations and increases the respiratory capacity; that its action on the heart and vasomotor system is altogether secondary to its action on respiration; that its sedative influence is greater than that of either morphin or codein; and that it is only one-tenth as poisonous as the latter drug. Floret³ states that he has administered heroin to 60 patients. The drug was given in powders or dissolved in water slightly acidulated with acetic acid, the dose being from $\frac{1}{14}$ to $\frac{1}{7}$ gr. 3 or 4 times daily. The cases cited by the author included pharyngitis, tracheitis, bronchitis, phthisis, etc. A prompt ameliorative action upon the cough and pain was observed in all cases, especially in those of long duration and associated with bronchitis and emphysema. In 3 cases of bronchial asthma, and in 21 out of 25 cases of phthisis, the beneficial effects were obvious. Apart from transient giddiness in 1 patient, no untoward effect was observed. Beketoff,⁴ in dose of $\frac{1}{10}$ gr., also found it useful in phthisis, but of little or no value in the dyspnea of heart-disease. Strube,⁵ while considering its anodyne action inferior to morphin, believes that it has a special action on respiration, and that the chief indications for its use are (1) dyspnea, where it is desirable to diminish the frequency of the breathing and to increase its depth; and (2) in pulmonary affections, where an irritative cough and dyspnea, with insomnia, are produced by accumulation of secretions. Manges⁶ is of the opinion that no larger dose than $\frac{1}{20}$ gr. should be administered to aged patients and in the advanced stages of tuberclosis. Turnauer⁷ believes that heroin is a useful remedy in cough, but often much less efficacious than morphin. He also observed nausea in 2 cases follow its employment. Leo⁸ also speaks highly of heroin in asthma, bronchitis, and emphysema. He found that in some cases it seemed to render the expectoration more difficult, but that this action was offset by combining the drug with potassium iodid.

Holocain.—This drug, which was introduced as a rival of cocain, has been very favorably received. A few drops of a 1% solution of the hydrochlorate instilled into the eye produce complete anesthesia in less than half a minute, which lasts for from 5 to 10 minutes. It does not affect the pupil, the intraocular tension, the accommodation, nor the vascularity of the eye; nor does it cause desiccation of the cornea. It is no more poisonous than cocain. Its failure to constrict the bloodvessels may prove an advantage or a disadvantage, according to the character of the operation. Randolph⁹ concludes from a series of clinical and bacteriologic experiments that the failure of the drug to dilate the pupil and to dry the cornea should recommend it for office use for removal of foreign bodies, as it is well known that after the employment of cocain in such

¹ Brit. Med. Jour., July 16, 1898.

³ Ibid.

⁵ Berlin. klin. Woch., Nov. 7, 1898.

⁷ Wien. med. Presse, Mar. 19, 1899.

² Therap. Monatsh., Sept., 1898.

⁴ Klin.-therap. Woch., Heft 14, S. 118, 1899.

⁶ Jour. Am. Med. Assoc., Dec. 10, 1898.

⁸ Deutsch. med. Woch., Mar. 23, 1899.

⁹ Bull. Johns Hopkins Hosp., July, 1898.

cases blurred vision and slight photophobia are often present for hours. A 1% solution has not only an inhibitory effect upon pus-organisms, but these organisms are killed when exposed to a solution of this strength for a certain length of time. This germicidal property still further enhances the value of the drug.

Hydrastinin Hydrochlorate.—Phillips and Pembrey¹ present the results of an elaborate study of the physiologic action of this drug. Briefly stated, they found that it increased the force of the heart's contractions, but lessened their number; that it produced contraction of the arteries, chiefly, however, through its action on the nervous system; that in poisonous doses it excited convulsions of spinal origin; that it is rapidly excreted by the kidney; that in cats and rabbits it did not cause contraction of the muscle-fiber of the uterus; and that in weak solutions (1:1000) it quickly produced disintegration of infusoria and delayed or suspended putrefaction in animals poisoned by the drug. Rouse,² as the result of a comparative study of the action of cotarnin hydrochlorate (stypticin) and **hydrastinin hydrochlorate**, concludes that both drugs are useful as hemostatics in uterine affections complicated by hemorrhage where contraction of the uterus is indispensable; but that hydrastinin ought to be preferred, since its action is not only oxytocic, but also vasoconstrictor, thus uniting all the conditions favorable to the arrest of hemorrhage. Stypticin has a tonic action on the heart lasting for some time; while hydrastinin is a cardiac stimulant whose effect soon passes off. On the other hand, hydrastinin acts more rapidly and energetically than stypticin, and may often replace ether and camphor as a stimulant.

Ichthyol.—Schiele³ urges the more general use of ichthyol instead of creasote in the treatment of phthisis. The advantages claimed for it are that it is followed by no ill after-effects, such as vomiting, and that the system is soon brought under its influence. Combemale and Desoie⁴ used the drug in phthisis for a period of 14 months, but observed improvement in only one-third of the cases. Bramthorne⁵ found it useful in atonic dyspepsia, and therefore recommends it as a substitute for creasote when the latter is not well borne by the stomach.

Kryofin.—This is a phenetidin derivative closely allied to phenacetin. It appears in the form of white, odorless crystals, which are but feebly soluble in water. The dose is from 5 to 8 gr. Its analgesic properties are about equal to those of phenacetin. As a hypnotic it is somewhat more active. The studies of Haas and Bennett,⁶ while indicating its usefulness as an antipyretic and analgesic, do not show that it is any less liable than phenacetin to produce in susceptible subjects cyanosis and collapse.

Largin.—This is a compound of silver and albumin which contains about 11% of silver, a larger amount than similar silver compounds. It is credited with bactericidal properties superior to those of any of the silver albumin preparations, while being free from irritating properties.

¹ Brit. Med. Jour., Oct. 8, 1898.

² Arch. Internat. de Pharmacodynamie, vol. v., fasc. 1 and 2, 1898.

³ St. Petersburg. med. Woch., Mar. 4, 1898.

⁴ Echo méd. du Nord, Apr., 1898.

⁵ Centralbl. f. d. gesammte Therap., June, 1898.

⁶ N. Y. Med. Jour., No. 1008, 1898.

Pezzoli¹ finds that it is so free from irritating effects that from 1% to 1.5% solutions may be retained in the urethra for as long as 30 minutes, and thus effect beneficial results. Such injections may be made several times a day. He reports on 41 cases of acute anterior urethritis of recent origin in which he used the treatment for an average of 30 days, 27 of which furnished successful results; in 8 cases little benefit was noticed. The remaining 6 were those in which the deep urethra was affected before this agent was employed, and only 2 of these cases were benefited. He found that though its bactericidal power was greater than that of the other silver compounds, protargol and argentamin excel it in penetrating power.

Lysol.—This is a coal-tar product, depending for its value upon the cresols which it contains. It has been extensively used as a disinfectant; and while less dangerous as a poison than carbolic acid or corrosive sublimate, its toxic properties should not be overestimated. During the past year 2 cases of poisoning by this agent have been added to the 13 previously reported. Kluge² relates the case of a woman, aged 35, suffering from a relapse of typhoid fever, who was given about 10 gr. of lysol by mistake. Cyanosis, stupor, collapse, marked rapidity of the heart, and mydriasis were the chief symptoms. After washing out the stomach and the free exhibition of stimulants the symptoms abated. Cramer³ reports a fatal case of poisoning from the use of 3 pints of a 1% solution of lysol as a uterine douche.

Mercury.—Carter,⁴ in discussing the various uses of mercury, states that there is one use that is not so well known as it deserves to be, and that is the employing of the solution of mercuric chlorid in half-minim or minim doses in a teaspoonful of water every hour for 10 or 12 hours a day, in fermentative disturbances in the stomach and intestines. It controls vomiting more effectually than any other drug, and will very often arrest diarrhea. As the drug is free from all odor and taste, no one objects to it. Ringer mentions its employment, but in much larger doses, namely, about $\frac{1}{80}$ gr. instead of $\frac{1}{2000}$ to $\frac{1}{1000}$ gr. [The large dose is quite unnecessary and may be harmful.]

Mercury Benzoate.—Since this remedy is less toxic than corrosive sublimate and does not precipitate albuminoids, it is especially useful for hypodermic administration. Brentonneau and Desesquelle⁵ have shown that mercury benzoate is decomposed in the presence of chlorid, bromids, and iodids, and that the drug is best administered in an aqueous solution of neutral sodium benzoate, in which it is perfectly soluble. In this solution it does not precipitate the albuminoids of the blood even after the addition of sodium chlorid. The following solutions are recommended for hypodermic injection: *R.* Mercury benzoate, $9\frac{1}{2}$ gr.; neutral ammonium benzoate, 47 gr.; distilled water, 2 oz. Or, *R.* Mercury benzoate, $9\frac{1}{2}$ gr.; neutral ammonium benzoate, 47 gr.; cocain, 2 gr.; benzoic acid, $9\frac{1}{2}$ gr.; distilled water, to make 2 oz.

Mescal Plant.—The physiologic action of the alkaloids of the mescal plant (*Anhalonium Lewinii*), a native of Mexico, has been tested by Dixon.⁶ He finds that the alkaloids are fully soluble in water, and

¹ Wien. klin. Woch., Band 11, S. 286, and Ephemeris, 1899.

² Münch. med. Woch., July 12, 1898.

⁴ Liverpool Med.-Chir. Jour., July, 1899.

⁶ Brit. Med. Jour., Oct. 8, 1898.

³ Centralbl. f. Gynäk., Oct. 1, 1898.

⁵ Jour. des Prat., May 6, 1899.

possess a remarkable similarity in their physiologic action. In therapeutic doses their chief effects would appear to be a direct stimulation of the intracardiac ganglia, an initial slowing of the heart, an elevation of arterial tension, and a direct stimulation of the brain and motor centers of the cord, as shown by the increase in reflex excitability.

Methylene-blue.—This substance has been tried in a great variety of affections, but the chief interest centers about its usefulness as an analgesic, antiperiodic, and germicide. Lemoine¹ found the drug useful in four-fifths of the cases of sciatica in which he employed it. Lasting benefit also followed its use in a number of cases of migraine. The lighting-pains of *tabes dorsalis* were but slightly relieved by it. Cardamatis² of Athens, Greece, has used methylene-blue in 275 cases of malaria. He found the advantages of this agent were especially noted in cases in which quinin was of little use or where an intolerance of it was met. Horwitz³ concludes, from his experience with methylene-blue in the treatment of 105 cases of gonorrhea, that it will not abort the disease, but that when used early, in doses of 1 gr. thrice daily, increased to 2 gr., it materially shortens its duration and lessens the tendency to complications; that the beneficial action of methylene-blue is enhanced by combining it with copaiba, sandalwood, and salol; that the drug always has the effect of giving the urine a deep-blue color, and of this fact the patient should be informed, to prevent unnecessary alarm; and that the remedy is of no value in nonspecific urethritis.

Naftalan.—This is a proprietary substance which, according to Coblentz, consists principally (96%) of a peculiar naphtha obtained from Russia, purified by distillation, and mixed with 2% to 4% of anhydrous soap to give it consistence and to render it gelatinous. It has been especially recommended as a local application in ulceration and inflammatory affections of the skin. Saalfeld,⁴ from an experience with naftalan in 115 cases, asserts that it has proved an effective remedy for eczema in all stages, and for light cases of psoriasis, prurigo, and parasitic sycois. Takowlew⁵ has found the drug very efficacious in chronic leg-ulcer. A piece of cotton-wool corresponding to the size of the ulcer is first dipped for a few minutes in an antiseptic lotion; then naftalan is spread on it and put on the sore parts; over this a piece of guttapercha tissue is placed and the whole secured by a bandage, care being taken that the parts, previous to the application, have been bathed and carefully cleansed. At first the bandage is changed after 8 or 10 days; later it may be left for a longer period. The advantages of this treatment are summed up as follows: 1. It greatly expedites the healing process. 2. It does not irritate the parts with which it comes in contact. 3. It is easily handled; the expense trifling. 4. It prevents putrefaction of the discharges.

Nirvanin.—This is one of the many local anesthetics recently put forth as a rival of cocain. Luxenburger⁶ has tabulated 94 operations in which this drug was used as a local anesthetic. He claims that it is only one-tenth as poisonous as cocain, and that under its influence the radical cure of hernia can be performed, as well as the removal of necrosed bone,

¹ Bull. gén. de Thérap., Apr. 15, 1899.

² Ephemeris, 1899.

³ Phila. Polyclinic, vol. vii., p. 113; Ephemeris, 1899.

⁴ Derm. Zeit., Dec., 1898; Jour. Am. Med. Assoc., Feb. 4, 1899.

⁵ Vratsh, Feb. 4, 1899.

⁶ Münch. med. Woch., Nos. 1 and 2, 1899.

the amputation of toes and fingers, etc. A 2% solution with sterilized salt solution is recommended.

Orexin.—This remedy has now been quite thoroughly tested, and seems to possess a certain value as a stomacheic and promoter of the appetite. Kolbl¹ has found it useful in the anorexia of nervous dyspepsia, convalescence after acute illnesses, hysteria, neurasthenia, and slight gastric catarrh. It is best given in pill or tablet, in a little cold water, 1 hour before the chief meals. The dose is from $\frac{1}{2}$ to 3 gr., increased to 7 gr., daily. According to Kolbl, orexin is contraindicated in all cases of hyperacidity of the stomach and acute inflammation or ulceration of the mucous membrane. Golmer,² like most clinicians, prefers the tannate to the hydrochlorid, since it is less irritating than the latter. He has found it particularly useful in the anorexia accompanying the early stage of phthisis. Hermann³ has used the drug successfully in 9 cases of vomiting of pregnancy. In 5-gr. doses after each meal it speedily relieved the vomiting and allayed the nausea.

Orthoform.—This substance has been extensively used during the past year as a substitute for cocain in relieving the pains of ulcers, wounds, excoriations, burns, etc. Being far less poisonous than cocain, it can be applied with comparative safety to open surfaces. The drug is not adapted to hypodermic use, orthoform itself being insoluble and the hydrochlorid being acid and irritating. Cheatham⁴ states that the results obtained with orthoform at the Munich Surgical Clinic may be summarized as follows: 1. Loss of sensation commences on the average in from 3 to 5 minutes after application, whether as a powder or as a 10% or 20% ointment. 2. The anesthetic action continues on the average for about 30 hours, in many cases even for 3 or 4 days. Only in 1 case did the action last scarcely 2 hours, the powder being carried away by copious secretion. 3. Diminution of secretion is always observed, a feature which is very valuable, for instance, in transplantations, where the grafting of the transplanted skin is promoted. The reduction of very copious and troublesome salivation in a case of inoperable cancer of the cheek was also noted. 4. Nonpoisonousness is demonstrated by the fact that in a case of carcinoma 2 oz. weekly were applied without any bad effect. 5. As regards antiseptic qualities, no special experiments were made on patients, but no bad influence on wounds was experienced. Purulent discharge was never occasioned, but when present ceased shortly after application of the powder.

As an illustration of the nontoxicity of orthoform, 2 cases are reported in the *Münch. med. Woch.* of Oct. 18, 1898: one an extensive cancer of the mamma; the other a bedsore, in which orthoform was used every day for months to relieve the pain, with complete success and without the slightest indication of poisoning. In the first case 4426 gm. were used in 5 months, and in the second 5600 gm. in 7 months. Brocq,⁵ however, has not found the drug entirely free from irritating properties. He describes 2 cases in which the local application of orthoform produced very troublesome symptoms. In one patient the application of an ointment (1:40) to the face induced great swelling and marked redness, lasting

¹ Therapist, No. 5, 1898.

² Allg. med. Central-zeitung, July 6, 1898.

³ Therap. Monatsh., Heft 1, S. 24, 1899.

⁴ Am. Pract. and News, Aug. 15, 1898.

⁵ Presse méd., Apr., 1899.

nearly 3 weeks. In another patient the use of the powder on a fissure of the vulva caused intense tumefaction and nodular swellings in various parts of the body.

Maygrier and Blondel¹ have found applications of a saturated solution of orthoform in 80% alcohol useful in fissures of the nipple.

Klaussner² calls attention to a **new orthoform**, which is whiter than the old preparation and considerably cheaper.

Ovarian Extract.—Seeligmann³ has found this remedy useful not only in typical climacteric phenomena, but also in psychical depression and the constitutional affections which, after long remaining latent, develop at the time of the menopause. In the 3 cases of Basedow's disease also the effect was quite marked. In the hands of Jayle⁴ it has been serviceable in some forms of amenorrhea and dysmenorrhea, and in anemia of ovarian origin.

Oxycamphor.—This is a derivative of camphor in which a hydrogen atom is replaced by an hydroxyl molecule. In commerce it appears as a white, crystalline, odorless, and slightly bitter powder, soluble 1 : 50 in cold water, and more readily soluble in hot water and in alcohol. Ehrlich⁵ recommends it as a respiratory stimulant very effective in dyspnea from various causes. It may be prescribed in compressed tablets containing about 4 gr., which, in order to prevent gastric irritation, should be administered in hot water. The daily amount of the drug may be as much as 30 gr. Jacobsen⁶, who has found it very effective in the dyspnea of diseases of the heart, lung, or kidney, prefers to exhibit it in the form of a 50% alcoholic solution.

Paraldehyd.—Attention has recently been called to the value of this drug as a respiratory sedative in asthma and other forms of dyspnea. Shoemaker⁷ has found it advantageous in chronic bronchitis, asthma, and in the dyspnea dependent upon heart-, lung-, and kidney-disease. Mackie⁸ also praises it as a sedative in spasmodic asthma. He admits that if continually exhibited it loses its power, but not so rapidly as do many other drugs of the same class. A good method of administering it is with an equal amount of syrup of orange-peel, freely diluted with water.

Peronin.—Meltzer⁹, who has studied the therapeutic action of this drug, which is the hydrochlorid of the benzyl ether of morphin, concludes that in dose of from $\frac{2}{3}$ to $1\frac{1}{2}$ gr. it acts similarly to morphin, but is free from any unpleasant after-effects. As a hypnotic he places it in effectiveness between morphin and such drugs as paraldehyd, sulfonal, and trional. Its chief drawbacks are its slight solubility and its unpleasant taste.

Picric Acid.—Dakhye¹⁰ asserts that picric acid makes the best topical application in hastening the cicatrization of burns. He claims that it is harmless, both to children and adults, but that it is contraindicated in very young children, and in deep, old, or suppurating burns. The technic consists in antiseptic cleansing of the burn in a 1%

¹ Rev. de Thérap. méd.-chir., No. 23, 1898.

² Münch. med. Woch., Oct. 18, 1898.

³ Allg. med. Central-zeitung, No. 3, 1898.

⁴ Rev. de Gyn. et de Chir., No. 4, 1898.

⁵ Centralbl. f. d. gesammte Therapie, Heft 1, S. 1, 1899.

⁶ Berlin. klin. Woch., Apr. 17, 1899.

⁷ Merck's Archives, No. 3, 1899.

⁸ Lancet, No. 1, 1899.

⁹ Therap. Monatsh., Heft 6, S. 316, 1898.

¹⁰ Progrès méd., Jan. 7, 1899.

solution of picric acid, exercising great care in preserving the epidermis. In superficial burns excellent results were obtained by painting with a saturated solution of picric acid in ether or alcohol. MacDonald¹ also speaks favorably of this drug in the treatment of burns. He applies as a dressing gauze, dampened in a saturated aqueous solution of the acid, and covers the part with absorbent wool and a light gauze bandage. The advantages claimed for this treatment are its simplicity, painlessness, rapidity of healing, minimum of suppuration, absence of local or general toxic effects, and a smoother, more natural cicatrix than that obtained with other methods. Radaeli² has obtained favorable results from a 10% aqueous solution of picric acid in the treatment of acute eczema and in the exacerbations of chronic eczema.

Pilocarpin.—West³ believes that there is no more useful drug in chronic interstitial nephritis than pilocarpin given in small doses, 2 or 3 times a day, by the mouth, or in urgent cases subcutaneously. He finds that headache, irritability, restlessness, digestive disturbances, and dry skin often rapidly yield to a dose or two of pilocarpin, and the patient be restored to comfort or even threatening symptoms be removed. He adds that in chronic nephritis the drug often does not produce the sweating which under ordinary conditions it usually excites.

Piperazin.—Giofredi⁴ reports a case of gout in which he successfully employed injections of piperazin to remove a uratic deposit from the tendon-sheath of the peroneus longus. The man's general condition had improved under the internal administration of piperazin, but the tophus remained unaffected. He thereupon made 10 injections into the mass, each consisting of 8 minims of distilled water and $\frac{5}{6}$ gr. of piperazin. A little burning followed the first injection, but this was allayed by the application of ice, and in subsequent operations all pain was avoided by having the part first sprayed with ether. The complete absorption of the tophus was effected by the treatment. The author expresses the opinion that gouty joints might be as successfully treated in a similar way, if strict antiseptic precautions were used.

Potassium Iodid.—The best method of prescribing potassium iodid, according to Koenig,⁵ is doubtless in the form of an aqueous solution, of which 1 drop represents, approximately, 1 gr. of salt. To prescribe the salt in water ounce for ounce results in a solution measuring 11 fluid-drams, and 1 drop of this necessarily contains considerably less than 1 gr. of the iodid. To overcome this, Hynson⁶ makes the following suggestion: Dissolve 480 gr. of salt in $5\frac{1}{2}$ drams of hot water, and then make up the solution to 8 drams with water. This always results in a solution representing 1 gr. in each minim, and, approximately, in each drop. Administered in this form in gradually increased doses, the severer symptoms of iodism may always be prevented.

Montgomery⁷ urges the use of potassium iodid in cases of threatened abortion, even when the history leaves the question of syphilis in doubt. He states that he attaches so much value to the drug that it is his custom in every case of irritable uterus, where abortion is to be feared,

¹ Brit. Med. Jour., May 13, 1899.

³ Brit. Med. Jour., Mar. 11, 1899.

⁵ Penna. Med. Jour.

² Settimana Med., No. 9, 1899.

⁴ Gaz. degli Ospedali, Aug. 20, 1899.

⁶ Bull. of Pharm.

⁷ Internat. Med. Mag., July, 1899.

to place the patient upon the use of iodid, 5 gr., 3 times, in water, after meals.

Potassium Permanganate.—Kronig and Paul¹ claim to have discovered a most powerful disinfectant in a mixture of potassium permanganate and hydrochloric acid. This solution kills in a few minutes the most resistant spores from extremely virulent anthrax-bacilli. As a disinfectant for the hand, they recommend the formula: 45 cc. of pure hydrochloric acid, diluted with 1600 cc. of water, and 500 cc. of a 5% solution of potassium permanganate. The solution stains the skin, but the stain is easily removed with a 1.3% solution of oxalic acid. Nassauer² has found a weak (faint rose-colored) solution of potassium permanganate, used in a nasal cup or by other methods of irrigation, very effective in aborting acute coryza.

Protargol.—This is a silver albuminose containing about 8% of silver. It is freely soluble in water, the solution being neutral, and not affected by heat, hydrochloric acid, weak solutions of sodium chlorid, or albumin. It contains a larger percentage of silver than its allies argonin (4.2%) and argentamin (6.3%). Neisser, Fenger, Meissner, and Furst have lauded its usefulness in gonorrhea when employed in solutions of 0.25% rapidly increased to 1% or 1.5%. Behrend³ dissents from this favorable opinion, and asserts that the remedy has no influence on the clinical course of the disease.

Bossalino⁴ speaks favorably of protargol in 0.5% solution as a lotion, and in 5% to 10% solution as an application in catarrhal conjunctivitis. In phlyctenular conjunctivitis and blepharitis it was not particularly satisfactory.

Peck⁵ claims for protargol and argonin the following advantages over the other silver salts in treating the purulent ophthalmia of children: 1. Quick destruction of the gonococcus. 2. The earlier disappearance of the secretion and of the inflammatory process. 3. The more prompt restoration of the injured cornea and other tissues to the normal. He thinks protargol should not be used in greater strength than 0.5% to 2%.

Pyramidon.—This is an antipyrin derivative, appearing as a whitish, tasteless, crystalline powder, freely soluble in water. It has an action similar to antipyrin, but it is claimed that it is effective in smaller doses. Linbeck⁶ of Vienna has found it useful as an antipyretic in tuberculosis, and as an analgesic in rheumatism when the salicyl compounds cannot be tolerated. Like antipyrin, it appears to be most efficient in headache, migraine, and the various neuralgic affections. The dose is about half that of antipyrin. Brandeis of Prague observed profuse perspiration and threatened collapse in a number of cases of typhoid fever, with doses varying from $1\frac{1}{2}$ to $3\frac{1}{2}$ gr.

Rubidium Iodid.—Colombini and Pasquini⁷ claim that this is the only iodid which up to date has satisfied all those who have tried it in their search for a substitute which shall possess all the advantages of potassium iodid without its disadvantages. It is asserted that rubidium

¹ Medicine, Feb., 1899.

² Ibid., Heft 12, S. 414, 1898.

³ Pediatrics, vol. ii., p. 129.

⁴ Klin.-therap. Woch., Heft 1, S. 7, 1899.

⁵ Gaz. degli Ospedali, Nov. 27, 1898.

⁶ Ephemeris, 1899.

⁷ Jour. des Prakt., Oct. 15, 1898.

iodid has an action identical with that of potassium iodid, and, moreover, possesses the advantages of being more easily tolerated and less disagreeable to the taste.

Salol Tribromid.—Villon¹ speaks favorably of this drug, in doses of 30 gr. at bedtime, as an hypnotic in certain chronic affections, such as parietic dementia. In the insomnia of hysteria, melancholia, and great nervous excitement the remedy did not prove efficacious.

Salophen.—The therapeutic value of this drug may be said to be now definitely settled. Creslé² presents a very just estimate of its efficiency in rheumatism and certain neuralgic affections. It exerts, he says, an incontestable action upon acute and subacute rheumatism, but its effects are less constant than those of sodium salicylate. In chronic and blennorrhagic rheumatism it has not shown itself superior to other drugs. Salophen possesses a powerful analgesic action, which is exercised even in those cases in which this drug cannot be looked for to effect a cure. It has given good results in migraine, in various neuralgias, and in sciatica. Salophen employed in a medium dose produces no phenomena of intolerance, nor does it occasion headache, buzzing in the ears, or troubles of vision, but intolerance appears to be rapidly induced. In certain cutaneous affections salophen appears to have some efficacy, but it is necessary to wait for further experience. The medium dose of salophen is 60 gr. daily, more or less, according to the gravity of the complaint.

Sanatogen.—This name has been given to a food-preparation consisting of a glycerinophosphate of sodium casein. It is readily soluble, and has a pleasant taste and odor. It contains about 95% of casein and 5% of sodium phosphoglycerid, and is given in doses of a teaspoonful or more, stirred with a little water and then added to soup, cocoa, etc., as desired. Gumpert³ states from his experience with sanatogen in 30 patients that its prolonged use produced no disgust for it, nor any bad after-effects; on the contrary, he was able to strengthen the patients and make them gain in weight by means of it.

Silver.—Considerable attention has been paid during the past year to the use of soluble metallic silver, in the form known as **unguentum Credé**, in the treatment of various septic and infectious diseases. Credé⁴ gives the following formula of the ointment and the directions for its use: 15% of soluble silver is incorporated in lard by the same method as is the mercury in gray ointment, and to the product 10% of wax is added. The ointment is flavored with benzoinated ether. From 20 to 30 minutes are required for inunction. This ointment has been highly recommended in acute suppurative processes, as phlegmon, lymphangiectasis, lymphadenitis, furunculosis, erysipelas, puerperal fever, septicemia, gonorrheal and articular rheumatism. In general sepsis or when inunctions are not impracticable, it may be given internally as a pill: Soluble silver, $\frac{1}{8}$ gr.; sugar of milk, $1\frac{1}{2}$ gr.; glycerin, $1\frac{1}{2}$ minims, with sufficient water. Two of these may be given twice or thrice daily, followed by from 3 to 6 oz. of boiled water or tea. These pills are suggested as being tonic, and do not interfere with digestion. In solution of 2:10,000 or 1:10,000, it may be used for irrigation. In strength

¹ Sem. méd., Mar. 20, 1899.

² Gaz. hebdom. de Méd. et de Chir., Dec., 1898.

³ Deutsch. med. Woch., vol. xxiv., No. 40, 1898.

⁴ Klin.-therap. Woch., Heft 14, S. 460, 1898.

of 1:2000 to 1:500, in severe sepsis, it can be administered intravenously. Welter¹ claims to have secured remarkable results in a series of cases of general infection from the employment of the soluble silver salts after the method of Credé. He believes the best method of using the agent is by the employment of inunctions of the unguentum Credé. Through this means, he asserts, a general systemic effect is produced by the rapid absorption of the silver, and thus a general antiseptis of the entire organism is effected. Jones² testifies to the value of this ointment in a very severe case of puerperal sepsis. Bainbridge,³ from personal observation of the results obtained by Credé in the use of soluble silver as an antiseptic, reports the following favorable points: 1. No evidence of suture-irritation. 2. No stitch-abscesses. 3. No area of dermatitis about the wound, as is sometimes seen with iodoform. 4. No systemic effect even when the amount of antiseptic was large. Dieckerhoff⁴ reports the successful treatment of 4 cases of purpura hæmorrhagica in horses by the use of soluble colloid silver given by intravenous injection. Schrimmer⁵ states that he has successfully employed inunctions of unguentum Credé in 9 cases of epidemic cerebrospinal fever. One ounce of the ointment was rubbed in daily for 3 days, and $\frac{1}{3}$ oz. at each relapse. Cases in which the treatment was not begun until grave symptoms appeared are said to have recovered, and in no instance was there left behind defect of special senses. [The soluble silver ointment is an effective application for the local treatment of septic phlebitis.]

Sodium Cacodylate.—Renaut⁶ recommends sodium cacodylate as an arsenic preparation suitable for administration by the rectum. This salt contains nearly 50% of arsenic, and has the great advantage of being nontoxic, for even 1 gm. injected into the veins of a rabbit does not cause death. Renaut employs a solution containing $\frac{1}{10}$ gm. of the salt to 1000 gm. of water, and injects 2 syringefuls of this solution into the rectum per diem for 2 days, and then 3 syringefuls per diem for 6 days, after which the patient is allowed to rest for 5 days. Sodium cacodylate, it is claimed, acts as a gentle nervine tonic and prevents waste. It is useful in the treatment of the early stages of tuberculosis; also in diabetes and in Graves's disease. According to Gautier, who first suggested the use of this salt, its nonpoisonous character is to be attributed to the fact that it replaces phosphorus in the lecithins and nucleins. It is, therefore, living matter impregnated with arsenic that the leukocytes disperse throughout the circulation and bring into contact with the nervous centers, where it seems to become fixed. For tuberculous patients the author believes that it is better to give the remedy hypodermically than by the mouth. The dose of $1\frac{1}{2}$ gm. a day ought not to be exceeded; on an average $\frac{3}{10}$ to $\frac{3}{4}$ gm. should be given in 24 hours. The injections should be continued for 7 or 8 days, then stopped, and resumed as before, after a week's interval.

Sodium Chlorate.—Soupault⁷ states that he has attained remarkable results with sodium chlorate in the treatment of hyperchlorhydria, whether ulcer was present or not. In the paroxysmal crisis relief was

¹ Deutsch. med. Woch., No. 40, 1898.

² Obstetrics, No. 2, 1899.

³ Med. Rec., Oct. 15, 1898.

⁴ Therap. Monatsh., Heft 3, S. 162, 1899.

⁵ N. Y. med. Monatssch., vol. x., No. 11, 1898.

⁶ Lancet, June 17, 1899.

⁷ Rev. de Thérap. méd.-chir., No. 13, 1898.

rapidly obtained. The drug seems to diminish the gastric secretion without modifying its quality. The author prescribes the drug in the daily amount of 2 drams, in from 2 to 4 doses, as far as possible from meal-times. Renal disease is considered a contraindication to its use. [The beneficial results obtained warrant the belief that its sphere of usefulness may be extended still further.]

Sodium Sulphocarbolate.—Wilson¹ reports 3 cases of severe chorea in which he employed with advantage sodium sulphocarbolate. In one case, in which everything had failed and death seemed imminent, Wilson gave 20 gr. of sodium salt, with 1 gr. of quinin, every 2 hours, to be taken alternately. Chloral in doses of 30 gr. was continued, and also hot packs. After 48 hours improvement became marked, and the recovery was rapid. In another case, somewhat severe, the sulphocarbolate also gave a very satisfactory result. In a third case, however, a very severe case in an adult, it did not succeed so well, death resulting from exhaustion.

Sparteïn Sulphate.—Chapman² believes that in certain selected cases, chiefly those characterized by cardiac dilation, arising, so far as is known, from an accumulation of residual blood, this drug is invaluable. The dose recommended is $\frac{1}{2}$ to 1 gr. every 4 hours.

Strontium.—Wood and Arnold³ arrive at the following conclusions as a result of a series of experiments, both physiologic and clinical, concerning the action of the soluble salts of strontium. They find that strontium is a muscle-poison which stimulates muscle and afterward paralyzes it; and that its stimulating effect upon the circulation is the result of the widespread general influence of the drug on the muscle-fibers, both of voluntary and involuntary life. After a thorough trial in 6 cases they are of the opinion that the strontium salts are without value in heart-disease. They attribute this inactivity to the fact that the salts are decomposed in the alimentary canal, with the formation of an insoluble precipitate, thus rendering it impossible to obtain through the alimentary tract sufficient absorption of strontium to produce any systemic effect. The hypodermic method of administration is attended with so much local irritation as to forbid its practical use. Finally, they contend that in many cases the strontium acts simply as a vehicle for the carrying into the system the acid of the substance with which it is combined. Thus, in the case of strontium salicylate separation of the acid from the base begins in the stomach, while the strontium compound, passing into the intestinal tract, long remains there, and, according to clinical experience, acts beneficially upon digestion. This local influence is probably parallel to that of bismuth, except that it is probably less astringent. The insoluble salt, clinging by its weight and mechanical properties to the mucous membrane, yields with extreme slowness to decomposition and absorption, and exerts a long-continuing local influence.

Strychnin Arsenate.—Ide⁴ highly commends strychnin arsenate as a tonic. He strongly advocates its use in conjunction with hyoseyamin in intestinal colic. It produces contraction of the longitudinal muscle,

¹ Birmingham Med. Rev., July, 1899.

² Ibid., May, 1899.

³ Phila. Monthly Med. Jour., Apr., 1899.

⁴ Wisconsin Med. Rec., vol. ii., p. 75; Merck's Archives, July, 1899.

and thus aids in expelling the offending material, while the hyoseyamin acts as a sedative. He advises its use thus combined in retention of urine, distended gallbladder, strangulated hernia, and inertia uteri. In the latter trouble he tells us that it frequently expels the child in a few minutes after there have been hours of waiting. He further asserts that it is an excellent preventive of postpartum hemorrhage. As a tonic for aged people he holds it superior to all others; and in malarial affections, when strychnin is indicated, its contained arsenic makes it a most desirable addition. The dose ranges between $\frac{1}{134}$ and $\frac{1}{30}$ gr., repeated as often as every 2 hours, if necessary. Strychnin arsenate is soluble in 14 parts of cold water, while strychnin sulphate and chlorid require 50 parts each to dissolve them. Ide declares that there is never a case in which strychnin is indicated that arsenic is not also indicated, and that they therefore make an excellent combination.

Stypticin.—This is the trade name of cotarnin hydrochlorid, a soluble crystalline substance made by the oxidation of narcotin. Bossi,¹ who has carefully studied the drug, finds that it is a uterine hemostatic without ecbotic properties. He concludes that for animals it is less toxic than hydrastis, and that in patients it has not produced any disturbance worthy of mention; that in some instances of pregnancy with threatened abortion, besides a decided hemostatic action, there is noticed a marked sedative effect. Rousse and Walton² contend that the action of stypticin is less rapid than that of hydrastinin, but more persistent. In consequence they recommend hydrastinin when a prompt action is desired, as in the hemorrhages following childbirth; and stypticin when a sustained action is desired, as in uterine affections accompanied by hemorrhage, and due to circulatory disturbances.

Sulfonal.—No new uses for this drug have been reported during the past year, but cases of poisoning by it continue to be published with such frequency that a word of warning against the careless administration of the drug may not be out of place. In most instances the toxic symptoms have followed upon the use of the remedy continuously or frequently for several weeks or months; but in some, as in a case reported by Tresilian,³ serious symptoms developed after the exhibition of 35 gr. of sulfonal, given in divided doses of 20 and 15 gr., at an interval of 24 hours; and Murrel has cited 2 instances of death from 30 and 40 gr., respectively.

Suprarenal Extract.—Experiments have shown that when suprarenal extract is administered by intravenous injection it causes a marked rise in blood-pressure. Unfortunately, this effect is not observed after its administration by the mouth, and only in slight degree after its injection under the skin. The possibility of the extract being contaminated with other substances which might prove deleterious renders hazardous its administration intravenously; and therefore the employment of this remedy as a general circulatory stimulant cannot be placed upon a definite basis until the active principle shall have been isolated. The nearest approach to the successful separation of an active principle has been made by Abel, who obtained from the gland a brownish or grayish substance, the pierate of which, when dissolved in 25% alcohol and injected into the jugular vein, caused a marked rise of blood-pressure, lasting about 15 minutes.

¹ Riforma Med., No. 35, 1898.

² Belg. méd., vol. i., No. 20, 1898.

³ Brit. Med. Jour., Jan. 28, 1899.

Whether this substance is really the active principle of the gland, and, if it be so, whether its action is too evanescent to be of practical utility as a circulatory stimulant, are matters that must be determined by future investigations. In the meantime numerous reports confirm the great value of the drug as a local astringent, and its efficacy in some cases of Addison's disease, when given by the mouth. Swain¹ prepares an aqueous extract from the dried saccharated glands by adding 10 gr. of the latter to $\frac{1}{2}$ dram of cold water, and filtering the mixture after thorough stirring. This solution, however, keeps for only about 3 days. When sprayed on mucous membranes it gives a sensation of warmth or stimulation, and induces immediate blanching by causing contraction of the small bloodvessels. The author thinks the extract useful, when applied to the nasal mucous membrane, in producing temporary shrinkage, in reducing congestion, and in securing a moderate degree of patency in a nostril. He finds that the edematous hypertrophy of the middle turbinate, such as appears in sneezing catarrh and in asthmatics, is very favorably affected by the extract, and, moreover, that solutions of the extract materially assist in the production of anesthesia by cocain. He concludes that we have in suprarenal extract a powerful local vasoconstrictor and a contractor of erectile tissue which it is safe to use in very considerable amounts without any dangerous or deleterious effects, local or general. When applied to the conjunctiva, suprarenal extract causes a sense of coolness and marked blanching of tissues, but no mydriatic or myotic effect. Kyle² finds that in operations on Meibomian cysts, in which complete anesthesia under cocain is difficult to secure, on account of the great vascularity of the parts, by using extract the operation can be done with distinctly less pain than when cocain is used alone. He states that the extract is especially indicated in cases of chronic trachoma characterized by marked vascularity and laceration, in pannus, lacrimal inflammation, panophthalmitis, conjunctivitis, and iritis. Lermith³ reports the successful use of the drug in a case of recurrent epistaxis. A solution of cocain hydrochlorate (5 parts) in distilled water (95 parts) was introduced into the nasal cavities on cotton, and withdrawn after 5 minutes. Then sponges saturated with a solution containing boric acid, 3 parts; dried extract of suprarenal gland, 1 part; and distilled water, 96 parts, were inserted and allowed to remain for the same length of time. Applications were first made on alternate days, and then twice a week.

Lederman⁴ recommends the following for preparing serviceable solutions of the gland: 10 gr. of the extract are added to 1 dram of a 25% solution of glycerin in water. This is placed in a wide-mouthed bottle and well shaken. After standing for 2 days it is filtered. The author claims that this solution is not too viscid for spraying, and that it will keep clear for some time in a cool place.

Seibert⁵ reports another case of Addison's disease illustrating the efficacy of suprarenal extract. In this instance there was a gain of 20 pounds, with almost complete disappearance of the pigmentation. The dose was 5 gr. 3 times daily; later, 6 times daily.

Tannalbin.—This substance was one of the first compounds of

¹ N. Y. Med. Jour., Dec. 24, 1898.

² Ophth. Rec., Apr., 1898.

³ Brit. Med. Jour., No. 1991, 1899.

⁴ Laryngoscope, No. 4, 1899.

⁵ N. Y. Med. Monatssch., No. 3, 1899.

tannic acid and albumin to be introduced. It appears as a light-brown, odorless, and tasteless powder, and contains about 50% of tannin. Cozzolino¹ reports 40 cases of diarrhea in children in which he used tannalbin. In 2 cases only was it ineffectual, one a child with phthisis, and another with advanced atrophy. The dose was 3 to 7 gr. 5 or 6 times daily, alone or combined with $\frac{1}{100}$ part of calomel. Excellent results have also been obtained by giving an initial dose of castor-oil, and following this by 2 injections each day of 7 gr. of tannalbin in 2 oz. of a 10% decoction of starch, to which 3 drops of laudanum may be added. Moncorvo² of Rio Janeiro also concludes from a study of its use in 200 cases of infantile diarrhea and dysentery that tannalbin is a valuable acquisition in the treatment of infantile complaints.

Tannigen.—This is an acetic ester of tannic acid, and appears as a yellowish, odorless, and tasteless powder, insoluble in water. Frankhauser³ finds it superior to tannalbin as an astringent in catarrhal enteritis and in catarrhal colitis, particularly when characterized by copious mucous dejections, since, being insoluble, it passes through the stomach unchanged and manifests its astringent action chiefly on reaching the alkaline secretions of the bowel, where its decomposition is slowly effected.

Tannoform.—This is a combination of gallotannic acid and formaldehyd, and appears as a pale-pink powder, insoluble in water, but soluble in alkaline fluids. It is most too irritating for internal use, but has been successfully employed externally as an antihidrotic and antiseptic. Hesse⁴ speaks very highly of a mixture of tannoform, 1 part, and Venetian tale, 2 parts, in sweating feet. It has been successfully employed in the form of a 10% ointment in eczema and decubitus.

Tannopin.—This substance, which is also known as tannon, is a combination of urotropin (13%) and tannin (87%). It appears as a light-brown, tasteless powder, insoluble in water. Schreiber⁵ tried it in 32 intestinal cases, including acute and chronic catarrh, tuberculous enteritis, and typhoid, giving 7 to 15 gr. 3 or 4 times daily, with very good results, especially in the tuberculous patients. Fuchs⁶ also speaks highly of tannopin in tuberculous enteritis, but agrees with Schreiber in considering its action as a urinary disinfectant inferior to that of urotropin.

Thallium Acetate.—This drug, in doses of 1½ to 3 gr., has proved very efficacious in checking the night-sweats of phthisis, especially when administered about an hour before the expected sweating. Huchard,⁷ however, calls attention to the danger of causing alopecia from the continued administration of the drug, and contends that if it does not act upon the night-sweats within 4 days it is useless to continue it.

Thiocol.—This is the potassium salt of sulphoguaiacol acid, and contains about 52% of guaiacol. It appears as a white crystalline powder, producing on the tongue a slightly bitter, not unpleasant, taste. It has an advantage over other guaiacol preparations in being freely soluble in water. Renzi and Boeri⁸ have used this remedy in 24 cases of

¹ Gaz. degli Ospedali, No. 38, 1898.

³ Jour. Am. Med. Assoc., Oct. 15, 1898.

⁵ Brit. Med. Jour., Sept. 17, 1898.

⁷ Nouveaux Remèdes, No. 12, 1898.

² Merck's Archives, Feb., 1899.

⁴ Austral. Jour. of Pharm., Oct. 20, 1898.

⁶ Die Heilk., Aug., 1898.

⁸ Deutsch. med. Woch., No. 32, 1899.

phthisis in various stages. They conclude that the most suitable dose is 20 to 30 gr. a day, and that in such amounts the drug decreases the cough, lessens the bronchial secretion, and improves nutrition and strength, and that the remedy is readily absorbed, and free from all irritating properties. Maramaldi¹ contends that no other medicament produces such successful results in tuberculosis as thiocol. Frieser,² who has used it in 19 cases of phthisis, also recommends it for its nonstimulant action, entire freedom from irritating effects on the digestive organs, and its ready absorbability.

Thyme.—Fischer³ reports favorably upon the use of the saccharated extract of thyme, which is also known under the name of "pertussin," in chronic laryngeal and bronchial catarrh, and in pulmonary emphysema. This remedy has also been well spoken of in the treatment of whooping cough.

Thyroid Extract.—Hutchison⁴ has made a very thorough study of the pharmacologic action of the thyroid gland. The effect of the administration of the extract, he finds, is to increase oxidation, the products of disintegration of the nitrogenous tissues appearing in the urine entirely in the form of urea, uric acid and the xanthin-bases not being appreciably increased, while the products of fat-destruction are eliminated as carbonic acid by the lungs and as water by the kidneys. He calls attention to the large increase in the excretion of water which occurs under thyroid administration. On cessation of the treatment this loss of water is very quickly replaced, and is accompanied by a corresponding increase in weight. He contends that no other drug is capable of increasing oxidation-processes in the body in such a way, and that its action is comparable to that of muscular exercise. Hence the usefulness of the drug as an aid in combating an excessive accumulation of fat. He states that the most constant effect of the drug on the heart is to increase the rapidity of its action, but that along with this one often observes other disturbances, such as irregularity, palpitation, or even threatenings of failure. This action of the thyroid on the heart renders caution necessary in administering the remedy to patients with cardiac debility. In cases of obesity, when the fatty change may also have affected the heart, this is especially necessary. According to the writer, it has further been shown that the active part of the thyroid has no effect on the blood-pressure. On the blood of healthy persons small doses have no effect; while large doses cause an increased destruction of blood-corpuscles, just as of other cells. In myxedema, on the other hand, the stimulus which thyroid feeding gives to all growth and division is manifested in the blood by a rise in the number of the corpuscles. The active constituent of the thyroid appears to be excreted by the kidney. Hutchison has found iodine in the urine of a dog within 3 hours after the administration of 1 gr. of colloid matter. The excretion of the active constituent of the thyroid appears to be a gradual one, the action of the drug continuing often for several days after administration has ceased. As regards the dose, Hutchison contends that experience teaches that, whatever the preparation employed, it is best to give it in small doses frequently repeated rather than in large quantities at long intervals. It is also necessary to

¹ Therapist, May 15, 1899.

³ Deutsch. med. Woch., No. 27, 1898.

² Merck's Archives, Sept., 1899.

⁴ Brit. Med. Jour., July 16, 1898.

feel one's way, beginning with small doses and gradually increasing them. As regards "thyroglandin," which MacLennan¹ claims to be the active principle of the gland, Hutchison offers strong arguments to prove that it is nothing more than a mixture of the colloid matter with salts and extractives which are without therapeutic value.

Mossé² cites the case of a weak, cachectic newborn infant presenting a marked bilobed goiter. The mother, herself goiterous, was in excellent health, but mentally weak. The treatment of the mother consisted in the daily administration of 1.5 gm. of thyroid body. At the end of a month and a half her goiter had almost entirely disappeared, and in the infant the cure was complete.

Ebstein³ declares strongly against the thyroid treatment of obesity. In 7 cases in which he used this treatment there was only a slight reduction in the weight, and no more than could be obtained by proper dieting. He contends that the treatment is not rational, since there is a waste of the body-albumin as well as of the fat; and that, moreover, any improvement following the administration of thyroid preparations may be obtained with less danger by proper dieting. Notthaff⁴ cites a curious case in which the symptoms of Graves's disease resulted from the ingestion of large amounts of thyroid extract. A man, aged 43, took without medical advice, about 150 gr. of the extract a day; in 5 weeks he had lost 30 pounds and presented nearly all of the symptoms of well-developed Graves's disease, such as enlargement of the thyroid gland, tachycardia, exophthalmos, Graefe's and Stellwag's signs, moderate tremor, polyuria, and glycosuria. After withdrawing the drug and administering Fowler's solution the symptoms gradually disappeared, except the exophthalmos, which persisted for 6 months.

Schoerges⁵ states that he has obtained a principle from thyroid gland which is 10 times as active as desiccated extract, and in addition possesses the advantage of not readily decomposing. This substitute, which he has named aïodin, was obtained by precipitating with tannin the iodo-albuminates, the bases, and the mucous substance of the gland.

Bedard and Mabille⁶ have shown that arsenic is an antidote for the thyroid extract; and that if Fowler's solution is exhibited in conjunction with the extract, the latter may be given freely without producing any untoward symptoms.

Lambret⁷ reports a case which suggests that the administration of thyroid extract may be of value in lessening the time usually required for the union of fractures. The good results obtained by Gauthier with thyroid medication in delayed union of bones prompted Lambret to try the effect of the remedy on callous formation in a case of recent fracture. A man who had sustained a fracture of both bones of the leg was given 3 gr. of thyroid gland 3 times a day. Complete union was effected in 17 days.

Toluylenediamin.—Willoughby⁸ reports a favorable result with this drug in a severe case of biliary colic, which was apparently excited by the passage of inspissated bile or bile-sand. As other remedies failed

¹ Brit. Med. Jour., July 9, 1898. ² Rev. mens. des Mal. de l'Enfance, June, 1898.

³ Deutsch. med. Woch., Nos. 1 and 2, 1899.

⁴ Centralbl. f. innere Med., No. 15, 1898.

⁵ Nouveaux Remèdes, Aug. 24, 1898.

⁷ Echo méd. du Nord, June 11, 1899.

⁶ Gaz. hebdom., May 29, 1898.

⁸ Therapist, No. 3, 1899.

to give relief, toluylenediamin was given tentatively in the dose of 1 gr. a day, in pill-form. This amount was subsequently increased to 2 gr. a day. Within 3 weeks from the time that this treatment was instituted the attacks ceased altogether, and the patient was apparently restored to perfect health. The author agrees with Brunton in attributing to this drug a stimulating effect on the hepatic cells.

Toxins of Erysipelas.—Four exhaustive reviews of the treatment of malignant tumors by the toxins of the streptococcus of erysipelas and of the *Bacillus prodigiosus* have appeared during the past year. These reviews have been written by Moullin,¹ Fowler,² Shweiler,³ and Coley.⁴ As the conclusions reached by these writers are in the main similar, we shall quote from only the last two. Coley concludes his paper as follows: 1. The mixed toxins of erysipelas and *Bacillus prodigiosus* have an inhibitory action upon the growth of malignant tumors of whatever variety. 2. This influence is far more marked in sarcoma than in carcinoma, and differs very markedly in the different varieties of sarcoma, being most pronounced in the spindle-cell variety, and least in the melanotic. 3. A considerable number of inoperable sarcomas, the correctness of the diagnosis of which is beyond question, have entirely disappeared under this method of treatment. 4. A large proportion of these cases have remained free from recurrence more than 3 years after treatment, a period which has generally been accepted as of sufficient length to justify their being regarded as permanent cures. 5. The action of the toxins upon sarcoma must be regarded as a rapidly progressing necrobiosis with fatty degeneration. This action in no way resembles that of a local escharotic, but is rather specific in character, exerting its destructive influence upon the tumor-tissue when injected subcutaneously at a distance, as well as when introduced locally. 6. This method of treatment is attended with some risk unless certain precautions are taken. These risks are: (a) collapse from too large a dose, especially when injected into a very vascular tumor; (b) pyemia from insufficient care as regards asepsis, especially in the presence of a granulating or sloughing surface. That these risks are slight is shown by the fact that in upward of 200 cases of malignant tumor treated personally, death occurred in but 2 as a result of the treatment. 7. The use of small doses of the toxins for a short time after primary operation as a prophylactic measure theoretically has much to recommend it. 8. The action of the toxins upon sarcoma, as shown by the clinical results, is in strict accordance with the known action of the living streptococcus of erysipelas. Hence the method rests upon a perfectly logical and scientific basis. 9. The toxins, to be of value, must be prepared from highly virulent cultures of the streptococcus of erysipelas.

Shweiler gives a very complete review of the subject. In the first table are noted the effects of spontaneous or artificial erysipelas on malignant tumors. He cites 59 cases, of which 15 ultimately recovered, and 6 were fatal from the acute infection. A second table includes reports of 95 cases treated with erysipelas-toxin alone or in combination with the products of the *Bacillus prodigiosus*. Recovery occurred in 15 instances,

¹ Lancet, No. 3884, 1898.

² Am. Jour. Med. Sci., Aug., 1898.

³ Die Erysipel—Erysipelt toxin—und Serumtherapie der bösartigen Geschwülste, Leipzig, 1898.

⁴ Practitioner, Apr., 1899.

or about 16%. In 3 other cases there was some improvement; in 15 cases there was some marked constitutional disturbance—fever, pain, dyspnea, pneumonia, sepsis, emaciation, vomiting, or collapse; in 9 cases there was rapid increase of the growth; and in 14 cases death occurred during treatment, generally from collapse, sepsis, or pneumonia. A third table includes 49 cases treated with erysipelas-serum. In 37 of these there were local and constitutional disturbances, and in only 1 case was recovery observed. In 4 cases the treatment consisted in the use of cancer- or sarcoma-serum; but the results were in no instance favorable. It will be noted that the best results were obtained from erysipelas itself, 25% of the patients having recovered from the infection. From erysipelas-toxin and Coley's fluid the percentage of recoveries was about 16.

Tropon.—This is a new albumin compound derived from animal and vegetable sources, and said to contain about 85% or 90% of pure albumin with gelatin and extractives. Neumann¹ concludes, from a series of experiments, that tropon may replace the albumin of other nutritive substances; that it does not produce any unpleasant disturbances either in health or in disease; that it does not become repugnant after long-continued use; that it is cheaper than meat; and that its persistent, but not unpleasant, taste can be concealed by various foods.

Tuberculin.—Most of the literature relating to tuberculin that has appeared during the year has reference to the new tuberculin. At the meeting of the British Medical Association, held in Edinburgh, in July, 1898, McCall Anderson read a paper urging the more general use of tuberculin. He says: "It is the almost universal experience of those best qualified to judge that, when employed in suitable cases and with all due precautions, improvement results from the use of tuberculin. It is, however, the experience of many that this improvement is but too often temporary, the morbid condition relapsing sooner or later after the treatment is stopped. The accuracy of these observations cannot be gainsaid, but it appears to me that sufficient weight has not been given to the circumstance that 2 factors have to be taken into account in dealing with tuberculous disease: (*a*) the tubercle-bacillus; and (*b*) the soil favorable to its life and development. It is obvious, then, that in addition to the use of tuberculin, means must be taken simultaneously to change the soil upon which the microorganism flourishes, by means of good food, pure air, codliver-oil, and other antistrumous remedies, if we would hope to obtain permanently successful results." On the other hand, Klebs² contends that while the new tuberculin is a useful aid in diagnosis, and free from danger in its application as a diagnostic test, the method of preparing it makes it impossible to exclude contamination with other bacteria, and therefore renders it dangerous for therapeutic purposes. Heron³ regards new tuberculin as of more use than any other drug in the curative treatment of the very early stages of tuberculosis affecting either the lungs or the skin. Brocchieri⁴ has used the remedy extensively in lupus, and contends that it produces no disturbance, resolves the infiltrations of this disease, and limits diffusion of the process, as if immunizing the surround-

¹ Münch. med. Woch., Heft 2, S. 42, 1899.

³ Brit. Med. Jour., No. 1958.

² Ephemeris, 1899.

⁴ Il Policlinico, No. 21, 1898.

ing parts. Hirschfelder,¹ after citing 19 cases in which he employed oxytuberculin (a tuberculin obtained from virulent bacilli, but modified by oxidation), concludes that the best means for bringing about continuous and permanent improvement in tuberculosis is to be found in the new antiphthisic serum, aided by a properly selected climate. Freudenthal,² Holmes,³ and Reed⁴ speak favorably of its use; while Stempel,⁵ Spiegel,⁶ Abram,⁷ and a large majority of those who took part in the discussion at the Paris Congress, held in July, 1898, believed the remedy to be ineffective or even harmful.

Turpentine.—Herieourt and Richet⁸ publish the result of their experience with the use of turpentine inhalations in the treatment of experimental tuberculosis. Every fourth day, for a period of about 5 months, dogs were placed in a box for 1 hour, and during this time 1200 liters of air charged with 12 gm. of turpentine were passed through it. Of the dogs, 11 were inoculated with 0.1 cc. of a 3 months' culture of human tuberculosis; and of these, 3 were subjected to the turpentine inhalations, and 8 were not. Of the latter, all perished; of the former, 2 recovered completely. The authors claim that the success of this treatment is emphasized by the fact that in not a single instance out of 200 dogs inoculated during a period of 10 years and allowed to go untreated had the animal lived longer than 6 months.

Urotropin.—This is a compound produced by the action of formaldehyd on ammonia. It was first introduced by Nicolaier for the purpose of dissolving uric-acid concretions, and for preventing the development of bacteria in urine. As a urinary antiseptic it has already gained a relatively high rank. Casper⁹ finds that solutions of urotropin do not dissolve uric acid more readily than does water, but that it is a valuable remedy in phosphaturia, ammoniacal cystitis, and long-standing pyuria. Wilcox¹⁰ concludes, from a study of its action in several cases, that: 1. Urotropin produces no untoward symptoms when administered in amounts of 30 gr. a day. 2. It renders an alkaline urine acid, no matter what the cause may be. 3. It inhibits the development of microorganisms of ammoniacal cystitis, and in this way clears up cloudy urine. 4. It is indicated as a preparatory disinfectant in operations upon the urinary tract; in pyelitis, cystitis, and other inflammations of the urinary tract, irrespective of their cause; in phosphaturia, and in other conditions tending to the formation of urinary calculi.

Kelly¹¹ has been satisfied beyond all expectations with the action of urotropin in cases of cystitis and phosphaturia. Among several cases in which the drug proved valuable he mentions one that had been regarded as beyond medical aid, in which urotropin was brilliantly successful. Schiller¹² of Berlin has used the drug in 14 cases of cystitis in the female, in 4 of which the disease was of gonorrheal origin. All reacted promptly. The writer lays especial emphasis on the speedy relief from pain. While recommending the drug unreservedly, he considers that

¹ *Ephemeris*, 1899.

³ *N. Y. Med. Jour.*, Mar. 25, 1899.

⁵ *Ephemeris*, 1899.

⁷ *Lancet*, July 23, 1898.

⁹ *Monatsb. d. Krank. d. Harn- u. Sexual-Apparat.*, Heft 1, S. 1, 1898.

¹⁰ *Med. News*, vol. lxxiii., 1898.

² *Med. News*, Feb. 18, 1899.

⁴ *Internat. Med. Mag.*, Aug., 1898.

⁶ *Ibid.*

⁸ *Soc. de Biol.*, Nov. 18, 1898.

¹¹ *Therapist*, Oct. 15, 1898.

¹² *Merck's Archives*, June, 1899.

local treatment will often be found necessary. In the matter of dosage he adhered to Nicolaier's advice, and gave $7\frac{1}{2}$ gr. 3 times a day. In 1 instance he was obliged to give only 2 doses a day, as 3 produced burning in the bladder. Complete cure was observed after using 4 to 6 drams of the remedy.

Heubner¹ also speaks favorably of urotropin in the cystitis of children when the disease is associated with ammoniacal urine. Holmes² reports a case of cystitis, the result of prostatic hypertrophy, in which tying the vas deferens, and washing the bladder with boric-acid solution failed to give relief, but in which the administration of $7\frac{1}{2}$ gr. of this remedy twice daily reduced the urgency of urination, cleared the urine of pus, and enabled the patient to remain in bed at night, rising only once to micturate.

Veratrum Viride and Veratrum Album.—H. C. Wood and H. C. Wood, Jr.,³ conclude, from an experimental study of these drugs, that *Veratrum album* more frequently purges man when taken in toxic doses than does *Veratrum viride*, and that some specimens of *Veratrum album* are stronger than are some specimens of *Veratrum viride*. On the other hand, the authors believe that different specimens of *Veratrum viride* may vary greatly in their strength, and that some specimens of *Veratrum viride* may be stronger than some specimens of *Veratrum album*. They argue that while it is not probable that a clinician would be able to perceive any difference in the action of the therapeutic dose of the 2 plants, and that while it would be proper for the pharmacopeia to recognize both species, yet it would be better for the National Pharmacopeia to favor the American plant—*Veratrum album*.

Xeroform.—This substance is the tribromocarbolate of bismuth, and has been put forth as another substitute for iodoform. It is insoluble, inodorous, and tasteless, and is said to be free from irritating properties. Paschkis⁴ finds it very useful as a dusting-powder in various skin-diseases with areas of excoriation, especially in eczema. Ehrmann⁵ has found xeroform efficacious not only in the various forms of eczema, but in suppurative and gangrenous processes generally, such as venereal ulcers, leg-ulcers, buboes, and suppurating wounds. [The general trend of recent opinion is markedly in favor of this drug, which approaches very nearly to a perfect substitute for iodoform, but without its disadvantages.]

Yeast.—Turner⁶ states that Brocq has tried yeast in the treatment of furunculosis, and has found it most efficacious. This treatment has already been favorably spoken of by Follin, Gingeot, and Debouzy. Brocq began trying it in 1894, and has used it on about 50 patients suffering from diverse complaints, such as carbuncles, boils, and infectious or inflammatory diseases of the skin. Brocq recommends fresh beer-yeast, bakers' yeast not being so efficacious. The full dose is on the average 3 teaspoonfuls daily; but it may be increased to 9 or 10 in some instances. The yeast should be quite fresh. The writer admits that the remedy occasionally excites indigestion and even diarrhea, but claims that

¹ Therap. d. Gegenw., Heft 2, S. 63, 1898.

² Dominion Med. Monthly, No. 5, 1898.

³ Am. Jour. Med. Sci., May, 1899.

⁴ Wien. klin. Rundschau, vol. xi., p. 693, 1898.

⁵ Wien. med. Blätt., Heft 22, S. 343, 1898.

⁶ Therap. Gaz., Mar. 15, 1899.

these symptoms are not tenacious, and that by using the medicament discreetly no untoward results need be feared.

Baron ¹ advocates the use of yeast, in teaspoonful doses, 3 times a day, in conjunction with fruit-juices, in the treatment of infantile scurvy.

Landau ² recommends injections of brewers' yeast in vaginal gonorrhea, basing the treatment on the fact that yeast-organisms have greater vitality and propagate faster than gonococci, and are thus able to crowd out the latter.

¹ Münch. med. Woch., Band 45, S. 565 and 598, 1898.

² Lancet, No. 3045, 1899.

PHYSIOLOGY.

By G. N. STEWART, M. D.,

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Epitome.—Among the investigations of most general interest published since our last report are the work of Mathews on the origin of fibrinogen; of Thompson and Chittenden and his co-workers on the influence of proteid derivatives on coagulation; of Asher on lymph-formation; of Cleghorn, Hedbom, and others on the action of substances on the isolated mammalian heart; of Howell and his pupils on the automaticity of the heart; of Hunt on the cardiac nerves; of Huber on the vasomotors of the brain; of Langley, Bunch and Bayliss and Starling on the innervation of the intestine; of Cushny and Wallace and Höber on absorption; of Pflüger, Athanasiu, Cavazzani, and others on certain of the relations of the glycogen of the liver; of Cremer, and Lusk and his pupils on phloridzin-diabetes; of Magnus-Levy on diabetic coma; of Abel on the active constituent of the suprarenal capsules; of Schäfer and Vincent on the internal secretion of the pituitary body; of Loewy and Richter on the internal secretion of the ovary; of Oppenheim and Schäfer on the decussation of the sensory path; of Goltz on the phenomena following removal of extensive portions of the cerebral cortex; of Hardy on the structure of cell-protoplasm; and of Loeb on fertilization.

BLOOD, LYMPH, AND CIRCULATION.

Origin of Fibrinogen.—A. Mathews¹ brings forward weighty evidence in favor of the view that the leukocytes are the source of the fibrinogen of the blood, and speculates in an interesting manner [though here we follow him less readily] on the possibility that all the proteids of the blood are derived from broken-down leukocytes, the organism "living on its leukocytes as the egg-cells of some forms live on their follicle-cells."

Origin of Leukocytes.—J. Beard² [following Kölliker] asserts, and supports his assertion by ingenious arguments, that the thymus gland is the parent-source of all the leukocytes in the body; and that wherever lymphoid tissue is found elsewhere, the leukocytes in it are the descendants of leukocytes which originally emigrated from the thymus, and setting up for themselves, so to speak, founded colonies in regions remote from their native seat.

Influence of "Peptone" on Coagulation.—W. H. Thompson,³ and Chittenden, Mendel, and Henderson⁴ have elaborately investi-

¹ Am. Jour. Physiol., vol. iii., p. 53, 1899.

² Lancet, Jan. 21, 1899.

³ Jour. of Physiol., vol. xxiv., p. 374, 1899; vol. xxv., p. 1.

⁴ Am. Jour. Physiol., vol. ii., p. 142, 1899.

gated the influence of certain derivatives of proteids belonging to the peptone and proteose groups on the coagulation of the blood and on the vasomotor mechanism. While the results of these researches do not agree on all points, they clearly establish the existence of certain differences in the action of the various substances. Antipeptone, for instance, has invariably an accelerating influence on coagulation, and practically no effect on the blood-pressure; while all the albumoses investigated lower the blood-pressure and usually retard coagulation. The albumoses occasionally hasten coagulation [the result apparently depending less on the dose employed than on what, in our ignorance, we call the idiosyncrasy of the animal. The statements in regard to hemipeptone are conflicting, and obviously require to be tested by further experiments].

Osmotic Relations of the Blood.—H. Koepp¹ criticises Hamburger's method of determining the relative volume of the intracellular liquid and the stroma of the red corpuscles,² and ultimately rejects it. [While we think that several of Koepp's criticisms are just, he has himself fallen into error in saying that "we can assume with certainty that in the blood-corpuscles all the salts are present in the form of neutral molecules and none dissociated, since Bugarsky and Tengel have shown that the corpuscles do not conduct the electrical current." It is quite true that the red corpuscles have a very low conductivity; but this is not because there are no dissociated molecules in them, but because the ions are hindered from passing through the envelope.] That the relations of the envelope and stroma to the contents of the corpuscles are very peculiar has been shown by the observations of G. N. Stewart³ on the changes produced in the electrical conductivity and molecular concentration of the blood when it is laked in various ways. He shows that under certain conditions the large molecules of hemoglobin may pass out of the corpuscles, while the small molecules of the electrolytes (the salts) remain within them. Working with a method based on the low electrical conductivity of the corpuscles, he found⁴ that the plasma in dog's blood (in 30 animals) varied from 40% to 74% by volume of the blood.

Lymph.—L. Asher⁵ has continued the important work begun by him in conjunction with A. G. Barbéra.⁶ He states that the intravenous injection of bile [which, as is well known, increases the activity of the liver and the production of bile] causes an increased outflow of concentrated lymph from the thoracic duct. In this fact he sees a new support to his theory that the lymphogogues owe their influence on the lymph-stream to their stimulating the hepatic cells to greater activity. On the other hand, cholin, which does not increase the secretion of the liver, but does stimulate other glands, causes an increase in the flow both of thoracic and cervical lymph, but no increase in its concentration. The intravenous injection of small quantities of crystalloids is rapidly followed by a marked increase in the solids of the lymph, a fact which [as Asher justly remarks] it is difficult to reconcile with a purely mechanical theory of lymph-production. It indicates rather that metabolic processes are in play. It is also in accordance with this conclusion that, as R. Magnus⁷

¹ Arch. f. Physiol., S. 504, 1899.

² Ibid., S. 317, 1898.

³ Journ. of Physiol., vol. xxiv., p. 211, 1899.

⁴ Ibid., p. 356.

⁵ Zeit. f. Biol., Band 37, S. 261, 1898.

⁶ YEAR-BOOK for 1899, p. 952.

⁷ Arch. f. exper. Path. u. Pharmacol., Band 42, S. 250, 1899.

has pointed out, hydremic plethora produced by intravascular injection of physiologic salt solution does not cause general edema of the skin in normal living animals, but does so in dead animals or in animals poisoned by arsenic, chloroform, or other drugs. W. Roth,¹ too, in restating and extending the conclusions of Koranyi, has given indorsement to the view that the metabolic work of the tissues is an important factor in the production of lymph, by clearly pointing out that the decomposition of proteid substances in the cells must affect the osmotic pressure there, and, therefore, the exchange of fluid between them and the tissue-liquids and between the tissue-liquids and the blood.

Absorption from the Peritoneal Cavity.—The question whether absorption of substances introduced into the peritoneal cavity takes place by the bloodvessels or by the lymphatics has been much debated. Mendal² has reinvestigated the subject, and decides in favor of the view that the bloodvessels are the main channel of absorption [and this seems to be in accordance with the bulk of the evidence].

Heart.—[The methods of maintaining an artificial circulation through the isolated mammalian heart, inaugurated by Newell Martin and developed by Langendorff and Porter, must now be regarded as a portion of our ordinary physiologic technic, and they are being applied to all sorts of questions connected with the physiology and pharmacology of the heart.] Among the numerous researches of this nature published during the past year we may mention W. T. Porter's³ demonstration that the synchronism in the beat of the ventricles of the mammalian heart is not dependent on the auricles, but on the ventricles themselves, and is maintained not through nervous, but through muscular, connections. Von Vintschgau⁴ has also shown that in the frog's heart it is possible, by crushing a narrow longitudinal band of the tissue of the ventricle, to reduce a portion of the ventricle to rest, notwithstanding that its connection with the auricles is still intact, while the rest of the ventricle goes on beating.

Action of Substances on the Heart.—The action of extracts of various organs (suprarenal capsule, hypophysis cerebri, testis, liver, thyroid, etc.), and of certain bacterial cultures and the filtrates from such cultures, on the isolated heart of warm-blooded animals has been studied by A. Cleghorn.⁵ Suprarenal extract was by far the most powerful of all the animal extracts investigated. It always caused a marked augmentation of the contractions of the ganglion-free apex of the dog's heart. Extract of thyroid in small doses increased the force of the beat, while large doses had the opposite effect. Pathogenic bacteria and their toxins had an unexpectedly slight effect. Even large doses of very powerful diphtheria-toxins hardly altered the force of the beat, although the rate was diminished. F. Rolly,⁶ however, saw complete paralysis of the rabbit's heart produced by perfusion with blood containing diphtheria-toxin. [The explanation of the discrepancy is perhaps to be found partly in a greater sensitiveness of the rabbit's heart to the poison, and partly in the fact that, as Rolly points out, the toxin requires a considerable time to develop its paralyzing effect even when injected directly into the

¹ Arch. f. Physiol., p. 416, 1899.

² Am. Jour. Physiol., vol. ii., p. 342, 1899.

³ Ibid., p. 127.

⁴ Pflüger's Archiv, Band 76, S. 59.

⁵ Am. Jour. Physiol., vol. ii., p. 273, 1899.

⁶ Arch. f. exper. Path. u. Pharmacol., Band 42, S. 283.

organ, so that if the experiment was not continued long enough this effect might easily be missed.]

K. Hedbom¹ has investigated the action of a large number of drugs (caffein, chloral hydrate, aconitin, pilocarpin, strychnin, etc.) on the isolated heart of the rabbit and the cat. In suitable doses caffein always increases the pulse-rate and the amplitude of contraction. Strychnin in fairly large doses acts in the same way, although the effect is more transient. Chloral hydrate has, on the whole, an opposite action; while chloroform [as is already known] may cause paralysis of the heart. [That definite histologic alterations in the heart-ganglia are produced by inhalations of chloroform has been repeatedly asserted.] An important contribution to their study has been made by S. Schmidt.² Even after a single narcosis continued for three-quarters of an hour the ganglia show distinct degeneration phenomena. In rabbits the changes are in general less marked than in dogs and monkeys, but increase with the length of the narcosis. The action is cumulative, so that repeated narcoses at intervals of one or several days cause greater damage to the ganglia than a single prolonged narcosis.

Automaticity of the Heart.—Howell³ and his pupils, Greene⁴ and Walden,⁵ have published numerous experiments which indicate that calcium and, in a minor degree, potassium salts in the blood and lymph have a special relation to the maintenance of the automatic beat of the heart in cold-blooded animals (terrapi and frog).

Papillary Muscles and Reduplication of the First Sound.—[Starting with the assumption that Roy and Adams's well-known experiments have definitely proved that the papillary muscles contract independently of and later than the ventricles, an assumption, however, which all physiologists would not grant,] Sewall⁶ bases, on a careful clinical examination of a large number of cases, the conclusion that the common cause of reduplication of the first sound of the heart is the independent audibility of the vibrations of the auriculoventricular valves produced by contraction of the papillary muscles. Since [as Hayercraft and Paterson and others have shown] fatigue produces or increases the asynchronism of the papillary and ventricular contractions, the reduplication, according to Sewall, is usually due to the early fatigue and delayed contraction of the papillary muscles brought about by excess of intracardiac pressure. He therefore considers reduplication of the first sound as a sign of overstrain of the heart.

Cardiac Impulse.—Chauveau⁷ has recently repeated and extended by the aid of improved methods his classic researches on the cardiac impulse, and confirms in all important points his previous interpretation of the cardiogram, and particularly his statement [which has obtained such wide acceptance among physiologists] that the impulse is essentially produced by the systole of the ventricles. He shows that the cardiac impulse expresses externally with great fidelity the various internal phenomena of the ventricular systole.

¹ Skand. Arch. f. Physiol., Band 9, S. 1, 1899.

² Zeit. f. Biol., Band 37, S. 143.

³ Am. Jour. Physiol., vol. ii., p. 47.

⁴ Ibid., p. 82.

⁵ Ibid., vol. iii., p. 123.

⁶ Phila. Monthly Med. Jour., Sept., 1899.

⁷ Jour. de Physiol. et Path. gén., tome i., pp. 377, 785.

Cardiac Nerves.—R. Hunt,¹ continuing his researches on direct and reflex acceleration of the mammalian heart,² has found [in opposition to the usual statement] that the accelerators are almost always in a condition of tonic activity. Section of these nerves causes a prolongation of both the systole and diastole. He believes, however [and in this, we think, he echoes the general opinion], that reflex acceleration is caused usually, if not invariably, by inhibition of the tonic activity of the vagi. [It is known that excitation of the cephalic end of the cervical sympathetic may cause reflex acceleration of the heart and rise of blood-pressure. This has been explained by Hürthle as an indirect effect due to the stimulation of vasomotor fibers for the brain, and consequent excitation of the cardiac and vasomotor centers by the anemia thus produced.] François-Franck,³ however, shows that these are true reflex effects due to stimulation of afferent fibers in the sympathetic.

A good account of the general subject of inhibition, treated in a broad way, is given by S. J. Meltzer.⁴

Vasomotor Nerves.—Huber⁵ announces the results of an important histologic research which has established the existence of vasomotor fibers for the brain [a point the definite settlement of which has hitherto baffled physiologic investigation]. Gulland⁶ also, who formerly denied the existence of nerve-fibers in and around the cerebral blood-vessels, now admits their existence.

J. L. Bunch⁷ finds that the vessels of the small intestine are supplied with both vasoconstrictor and vasodilator fibers, which run mainly, if not entirely, in the splanchnic nerves. In the dog they leave the spinal cord by the anterior roots of the second to the sixteenth postcervical nerves, and have a cell-station in the ganglia of the sympathetic chain or the mesenteric ganglia.

Mott and Halliburton⁸ continue their work on the action of pathologic liquids. They state that the fall of arterial pressure produced by injection of cerebrospinal fluid from cases of general paralysis of the insane is due to the cholin contained in it. In connection with this the observation of Beattie Nesbitt⁹ that in complete obstruction of the small intestine at its lower end cholin and neurin may be found and recognized in the intestinal contents when food containing much lecithin—*e. g.*, yolk of egg—is taken, acquires additional interest.

RESPIRATION.

Mechanical Phenomena of Respiration.—By an ingenious application of the Röntgen rays W. Cowl¹⁰ has investigated the alteration that takes place in the position of the thoracic organs in respiration. These observations have added precision to our notions of the movements of the various portions of the diaphragm. The long axis of the ventricles

¹ Proc. Am. Physiol. Soc.; Am. Jour. Physiol., vol. ii., p. 9, 1899.

² YEAR-BOOK for 1899, p. 977. ³ Jour. de Physiol. et Path. gén., tome i., p. 724.

⁴ N. Y. Med. Jour., May 13, 20 and 27, 1899.

⁵ Proc. Am. Physiol. Soc.; Am. Jour. Physiol., vol. ii., p. 12.

⁶ Meeting Brit. Med. Assoc.; Brit. Med. Jour., 1899.

⁷ Jour. of Physiol., vol. xxiv., p. 72.

⁸ Ibid., p. 9.

⁹ Proc. Am. Physiol. Soc.; Am. Jour. Physiol., vol. ii., p. 8.

¹⁰ Verhandl. d. Berl. physiol. Ges., Apr. 14, 1899; Arch. f. Physiol., p. 574, 1899.

of the heart has been found to be directed further from the sagittal plane of the body in expiration than in inspiration, and the arch of the aorta sinks in expiration by about half the height of a vertebra. The heart as a whole sinks in inspiration, but not so much as the diaphragm.

Nervous Mechanism of Respiration.—A. Kreidl,¹ from a study of the effects of median section of the medulla oblongata on the movements of the vocal cords and the *ale nasi* in respiration, comes to the conclusion that the synchronism of the respiratory muscles on the 2 sides in normal breathing is due, on the one hand, to a continuous influence from the afferent pulmonary fibers of the vagus, and, on the other hand, to nervous paths connecting the corresponding nerve-nuclei across the middle line. So long as the vagi are intact mere median longitudinal section of the medulla does not of itself interfere with the synchronism of these accessory respiratory movements, and the same is true of section of the vagi alone. But a median section of the medulla accompanied by section of the vagi destroys the synchronism. [This is in agreement with Langendorff's doctrine that the synchronism of the halves of the diaphragm after median section of the medulla is achieved by means of impulses ascending the pulmonary branches of the vagus.] The regulating action of the vagus on the respiratory center is further discussed by B. Birukoff,² who, in the effects of simultaneous stimulation of both vagi, sees evidence [not by any means decisive, in our opinion] in support of Lewandowsky's theory that there is only one kind of afferent respiratory fibers in the vagus.

Cerebral Respiratory Centers.—[The existence of definite respiratory centers in the brain, above the level of the medulla oblongata, has been asserted from time to time.] M. Egger,³ in a careful investigation of 20 cases of hemiplegia, has found an almost absolute symmetry between the 2 sides of the thorax both in synchronism and amplitude of movement, and never any trace of respiratory paralysis. In 2 cases, however, he saw such differences between the 2 sides as led him to the conclusion that there exists in the cerebrum a region which exercises a marked influence on the amplitude of respiration. This region escapes injury in the lesions that most commonly lead to hemiplegia; and when it is involved actual paralysis of the movements controlled by it does not occur. W. v. Bechterew⁴ also announces the discovery in the frontal lobe of the monkey of 2 cortical respiratory centers, one of which causes deep inspirations and the other shallow and quickened breathing.

Effects of Alcohol on Respiration.—According to the exact observations of H. Wendelstadt,⁵ moderate doses of alcohol invariably increase the amount of the pulmonary ventilation in fatigued individuals, and often to a marked extent. In the absence of fatigue there is also in most cases an increase, although it is by no means so great.

Respiratory Exchange.—J. L. Smith⁶ [following up work already reported,⁷ in which strong evidence was adduced for the view that the absorption of oxygen by the lungs is a process analogous to secretion] has investigated the effects produced by oxygen at a high

¹ Pflüger's Archiv, Band 74, S. 181.

² Arch. f. Physiol., p. 525, 1899.

³ Jour. de Physiol. et Path. gén., tome i., p. 62.

⁴ Arch. f. Physiol., p. 500, 1899.

⁵ Pflüger's Archiv, Band 76, S. 223.

⁶ Jour. of Physiol., vol. xxiv., p. 19.

⁷ YEAR-BOOK for 1899, p. 956.

pressure. He shows that inflammation of the lungs may be caused (in mice) at an oxygen-pressure much below what is necessary to produce the toxic effects described by Bert; and he assigns a certain role in the causation of the so-called caisson-disease to congestion of the lungs and other organs by the high oxygen-pressure alone. [Nevertheless, it is impossible to ignore the fact that in many cases of the "disease" it is the too abrupt decompression that is the most influential factor. Nor is it easy to explain on the "oxygen-irritation" or "oxygen-poisoning" theory why prompt recompression should often remove the symptoms. Further, it has been established beyond a doubt by postmortem examination in fatal cases, in both men and animals subjected to rapid decompression, that bubbles of gas (nitrogen) are liberated in the bloodvessels.] Some experiments by V. Harley¹ appear to lead to the paradoxical result that when one lung is compressed by air in the pleural cavity, so that only the other remains active, there is not only an increase in the total amount of air breathed per minute, but also an increase in the oxygen absorbed and CO₂ given off. [We confess that we do not quite follow the theory he puts forward to explain this.]

Oxygen-capacity of the Blood in Disease.—[Bohr and others have asserted that the hemoglobin of the blood in anemia has an oxygen-capacity greater than the normal, so that a smaller amount of hemoglobin can take up as much oxygen as a larger amount in normal blood.] Kraus, Kossler, and Scholz,² using a very exact method of estimating the hemoglobin, have failed to detect any such difference. They therefore deny [and apparently with good reason] that the blood in anemia possesses any such power of accommodation as Bohr assumed. [Bohr's theory might have been supposed capable of explaining the curious fact that diving birds, such as the duck, survive submersion longer than other birds.] C. Richet,³ however, concludes that the phenomenon is due mainly to the circumstance that submersion causes in the duck and its congeners a great diminution in the rate of combustion of the tissues.

Carbonic Oxid.—[It is still a subject of controversy whether CO taken in by the lungs and combined with hemoglobin to CO-hemoglobin is oxidized in the body to CO₂ or excreted unchanged.] In a couple of not very satisfactory papers, Wacholtz⁴ decides that it is probable that the greater part of the CO is oxidized in the tissues to CO₂, and only so much given off without change by the lungs as corresponds to the difference in tension of the CO in the CO-hemoglobin and the air of the alveoli.

DIGESTION AND ABSORPTION.

Deglutition.—S. J. Meltzer⁵ communicates a further instalment of his important researches on the mechanism of deglutition. He shows [in confirmation of the previous results of Mosso, Kronecker, and himself] that the orderly progress of the peristaltic movements along the esopha-

¹ Jour. of Physiol., vol. xxv., p. 33.

² Arch. f. exper. Path. u. Pharmacol., Band 42, S. 323.

³ Jour. de Physiol. et Path. gén., tome i., p. 641.

⁴ Pflüger's Archiv, Band 74, S. 174; Band 75, S. 338.

⁵ Am. Jour. Physiol., vol. ii., p. 266, 1899.

gus depends not on reflexes arising in each part of that tube, but on processes taking place in a "deglutition-center."

Nerves of the Alimentary Canal.—[The exploration of the nervous mechanism of the digestive tract has proceeded apace in the past year.] J. N. Langley¹ makes the announcement that the vagus contains inhibitory fibers for the whole of the musculature of the stomach and the neighboring region of the esophagus. Stimulation of that nerve, as Openchowski has previously shown, causes dilation of the cardiac sphincter.

Bayliss and Starling² distinguish 2 kinds of movements in the small intestine: 1. "Pendulum" movements, due to rhythmic contractions affecting both longitudinal and circular coats, recurring at the rate of 10 or 12 in the minute, running first in one direction and then in the other, myogenic in origin and propagated along the muscular tissue. 2. True peristaltic contractions, which are veritable reflexes, started by mechanical stimulation of the gut and dependent on a local nervous mechanism (Auerbach's plexus). They put forward the hypothesis that local stimulation of the intestine causes excitation above and inhibition below the stimulated point. The definite downward progress of the peristaltic wave is thus secured. [While this research has certainly extended the boundaries of our knowledge of the intestinal movements, it is perhaps still more valuable as affording indications for future work than in the number of new facts definitely ascertained by it.] That the normal stimulus for the peristalsis is a mechanical one is rendered more probable than ever by the experiments of Eckhard,³ who rejects the common doctrine that the bile excites peristaltic contraction. The assertion of Bayliss and Starling that the splanchnic nerves do not contain any motor fibers for the intestine has been shown by J. L. Bunch to be incorrect.⁴ These nerves, according to him, really contain both motor and inhibitory fibers for both the circular and longitudinal coats.

Influence of Reaction on Activity of Saliva.—F. Kübel⁵ brings forward evidence which tends to upset the current doctrine that ptyalin acts best in a neutral or weakly alkaline medium. On the contrary, he finds that even the weakest alkaline reaction hinders it; while a weak acid reaction is highly favorable, especially when the acidity is due to some of the stronger acids, such as HCl. An amount of HCl equal to that in the gastric juice brings the activity of the ptyalin to an end; but we must suppose that for some time after the beginning of a meal the conditions for salivary digestion are more favorable in the stomach even than in the mouth. These results are in accordance with the observations of A. E. Austin,⁶ who finds, among other things, that the action of taka-diastase on starch is accelerated by the presence of a small amount of free HCl.

Potassium Sulphocyanid in Saliva.—[The most diverse views have been held as to the source and significance of the sulphocyanic acid in human saliva. Some have denied that it is constantly present.] F. Krüger,⁷ after an extensive series of observations, comes to the conclusion that it is a constant and normal constituent of saliva in man. [This

¹ Jour. of Physiol., vol. xxiii., p. 407.

² Centralbl. f. Physiol., Band 13, S. 491.

³ Pflüger's Archiv, Band 76, S. 276.

⁴ Ibid., vol. xxiv., p. 99.

⁵ Jour. of Physiol., vol. xxv., p. 22.

⁶ Boston M. and S. Jour., April, 1899.

⁷ Zeit. f. Biol., Band 37, S. 6.

agrees substantially with the experience of the author of this abstract, who, in the saliva of more than 200 healthy students, has in only a few instances been unable to obtain evidence of its presence.] According to Krüger, it is not a product of the decomposition of proteids [as Schiff suggested], nor is it due to the accidental contamination of the saliva with any of the constituents of tobacco-smoke [as Bernard supposed]. The amount is independent of age and sex, and of the healthy or unhealthy condition of the teeth.

Intestinal Juice.—E. Weinland¹ states that in all young mammals during the suckling stage, and also in the newborn child, there is present in the small intestine, throughout its whole extent, a ferment (lactase) which has the power of splitting up lactose. This is also found in the intestine of some adult mammals, though not of all.

Bile.—A. Pugliese² attributes to the spleen an important function in relation to the production of bile-pigment. After extirpation of the spleen, although the amount of bile secreted may be even greater than the normal, the quantity of bile-pigment is reduced to less than half. He therefore looks upon the spleen as an organ in which substances essential for the production of the bile-pigment are accumulated. [While these results are suggestive, they may, in our opinion, be made to bear another interpretation than the one put upon them by this observer, and further work must be awaited before a decision can be arrived at.] Experiments of A. Tedeschi,³ although they have no direct connection with this question, show that the livers and bone-marrow of animals deprived of the spleen are richer in iron than the livers of normal animals. This, whether it indicates an increase in the hemopoietic or in the hemolytic function of the liver, would, at any rate, show that the chemistry of the hepatic cells is affected by the absence of the spleen.

Comparative.—W. Biedermann and P. Moritz⁴ have elaborately investigated the function of the so-called liver of mollusks. The most novel result of their work is that the gland must be looked on as an absorbing organ of great importance. In addition, it possesses a digestive function, and acts as a storehouse for certain food-materials, as it does in vertebrates.

Absorption.—[The problem of absorption from the intestine, and particularly the question whether the essential factors are "physical" or "vital," continues to excite the interest of numerous workers.] R. Höber,⁵ for instance, continuing work already reported,⁶ comes to the conclusion that there is a proportion between the rate of absorption from the intestine and the velocity of diffusion of the salts investigated by him. [But he admits that this rule is broken by numerous exceptions, of which he can give no physical explanation, and this admission seems to us to be fatal to his generalization that the absorption of salts is a purely physical process.] Further, the results of Cushny and Wallace⁷ are opposed to the existence of any such uniform relation as Höber makes out. [Even in the case of the salts, then, so far as we can see, it seems necessary to admit that mere physical diffusion, filtration, and

¹ Zeit. f. Biol., Band 38, S. 16.

² Jour. de Physiol. et Path. gén., tome i., p. 22.

³ Ibid., Band 74, S. 225, 245.

⁴ Arch. f. Physiol., p. 60, 1899.

⁵ Pflüger's Archiv, Band 75, S. 1.

⁶ YEAR-BOOK for 1899, p. 959.

⁷ Ibid., p. 959; Pflüger's Archiv, Band 77, S. 202.

osmosis are not alone concerned in their absorption. The living cells of the intestinal wall appear to take an active share in the process, and modify the action of the physical factors in a manner not at present understood. When we come to the absorption of proteids and carbohydrates, as Höber admits, the vital activities of the cells become still more prominent, the physical factors still less influential. When the serous cavities and the intestine are compared, it is found—and the recent observations of O. Cohnheim¹ illustrate this very clearly—that in absorption from the former the physical factors, and in absorption from the latter the physiologic factors, are relatively the more important. The difference is certainly related to a difference in the nature of the cells engaged in absorption, the endothelium of the capillaries in the case of the serous cavities and the columnar epithelium in the case of the intestine.]

Absorption of Fat.—[A lively discussion has for some time been going on as to the changes which take place in fat before absorption. The most commonly accepted doctrine is that only a comparatively small portion of the fat is decomposed into glycerin and fatty acids in the intestine, and that the rest is absorbed as neutral fat in the form of a fine emulsion. But of late years the tendency has been to diminish the importance of emulsification as a factor in fat-absorption, and some observers have even gone so far as to assert that all the fat is split up in the intestine.] W. Cohnstein² now makes the interesting announcement that lanolin, which is a mixture of compounds of fatty acids with cholesterin and allied substances, is practically not absorbed at all, although it melts at about body-temperature and is easily emulsified. The group of esters of the fatty acids to which lanolin belongs is not easily split up and saponified. Cohnstein therefore draws the conclusion that all fat must be decomposed before absorption [and this seems a logical deduction, unless we suppose that the glycerin-esters of the fatty acids (ordinary fats) are selected by the intestinal epithelium in the emulsified form, while the cholesterin-esters are rejected].

Absorption of Proteids.—[The current statement that the proteids are absorbed by the rootlets of the portal vein, and not by the lacteals, has been questioned by Asher and Barbéra], but, as the recent experiments of L. B. Mendel³ have shown, on insufficient grounds.

Absorption of Iron.—G. Swirski⁴ has made a noteworthy addition to the already colossal literature of this subject. He states that a part of the iron is absorbed by the bloodvessels and a part by the lacteals. From the blood the iron is carried by the eosinophile leukocytes especially to the liver, where it is deposited in the hepatic cells, at first in the peripheral portions of the lobule, but when iron is administered for a considerable time, in the central portions as well.

Nutritive Enemas.—C. Ewald⁵ has shown by exact nitrogen estimations [what had already been proved by less elaborate methods] that under favorable conditions a large, and usually a considerable, amount of the nitrogen given by the rectum is absorbed.

¹ Zeit. f. Biol., Band 37, S. 443.

² Arch. f. Physiol., p. 30, 1899.

³ Am. Jour. Physiol., vol. ii., p. 137.

⁴ Pflüger's Archiv, Band 74, S. 466.

⁵ Arch. f. Physiol., Suppl. Band, S. 160, 1899.

METABOLISM AND NUTRITION.

Urea.—B. Schöndorff,¹ continuing his work on the distribution of urea in the body, finds that in most tissues and liquids the percentage of urea is nearly the same as in the blood. In the kidney and heart, however, it is greater, and in skeletal muscle somewhat less. He reiterates with greater emphasis [and apparently with a better foundation than ever] his statement that normal muscles contain urea, although Gottlieb and Schroeder,² using a new method for the estimation of urea, which depends on the separation of it in the form of oxalate, come to the conclusion that although the percentage of urea in the liver is, in general, less than in the blood, it is the only organ for which a urea-forming function has been certainly made out.

Uric Acid.—[It is well established that uric acid is formed in the bird, both from the end-products of proteid metabolism and from nuclein compounds and their derivatives. The latter method of formation has also been proved in the mammal.] Further evidence of this is adduced by Jerome.³ As to the manner in which uric acid is formed from the nuclein bodies, W. Spitzer,⁴ following up experiments of Horbaczewski, has shown that such substances as xanthin and hypoxanthin, and to a less extent adenin and guanin, are oxidized to uric acid by atmospheric oxygen in the presence of certain substances contained in extracts of the liver and spleen which act as oxygen-carriers.

As to the tissues from whose decomposition uric acid arises in the intact body, Hale White and Gowland Hopkins⁵ conclude, from estimations of N and P in the urine in 2 cases of leukocythemia, that there is no necessary proportionality between the number of circulating leukocytes and the amount of excretion of the products (P_2O_5 and alloxur bodies) which result from the breaking down of nucleins. The excretion of uric acid was only a little above the normal. They suppose that if there is increased breaking down of leukocytes, the nucleins may be reserved for building up new leukocytes.

Schreiber and Waldvogel⁶ also find that an increase in the decomposition of tissue-proteid is not always accompanied by an increased excretion of uric acid. They further conclude that the amount of uric acid excreted bears no constant relation to the total nitrogen or urea of the urine, nor to its acidity. The portion of the uric acid which arises from the food is subject [as, of course, might be expected] to considerable individual variations; while the portion arising from the metabolism of the tissues is, under normal conditions, fairly constant. In this relation we must take account of the fact demonstrated by H. Wiener⁷ that uric acid may be destroyed as well as formed in the body, being changed into glycocol, especially in the kidney.

Hopkins and Hope⁸ confirm the statement of Mares, that during the period of increased N-excretion caused by a meal, the increase of uric acid occurs particularly in the hours immediately following the taking

¹ Pflüger's Archiv, Band 74, S. 307.

² Arch. f. exper. Path. u. Pharmakol., Band 42, S. 238.

³ Jour. of Physiol., vol. xxv., p. 98.

⁴ Pflüger's Archiv, Band 76, S. 192.

⁵ Jour. of Physiol., vol. xxiv., p. 42.

⁶ Arch. f. Exper. Path. u. Pharmakol., Band 42, S. 69.

⁷ Ibid., S. 375.

⁸ Jour. of Physiol., vol. xxiii., p. 271.

of food, and does not last so long as the increase in the uræa. Since the nucleins of the food are comparatively little affected by the earlier stages of digestion, Hopkins and Hope suggest that the portion of the uric acid excreted which is immediately related to the food is not derived from nucleins in it, but from some other substances. They state, indeed, that extracts of thymus gland containing only traces of nucleins or nucleic acid cause, when injected, the same characteristic increase in the uric-acid excretion as the entire gland.

Glycogenesis.—[It is known that although the glycogen in the liver and muscles diminishes very rapidly in the first days of starvation, it does not completely disappear in the mammal even after several weeks, and in the frog even after several months.] At the end of winter-sleep the frog, as Athanasiu¹ demonstrated, contains more glycogen than in summer; and such facts led Voit to the conclusion that in starvation and in hibernation glycogen can arise from the splitting up of the fat or proteid of the tissues. Pflüger,² however, and Athanasiu³ have shown that this is not a correct deduction. They consider that the glycogen found at any time represents merely a balance struck between the glycogen formed and the glycogen used up, and that the amount is larger after winter-sleep, not because more is produced in winter, but because less is destroyed than in summer. These observations were carried out by the aid of a method of estimating glycogen, based on the well-known method of Külz, but including certain modifications, which, according to Pflüger, are absolutely indispensable, by J. Weidenbaum,⁴ E. Pflüger,⁵ Pflüger and Nerking,⁶ E. Pflüger.⁷

[In spite of Pavy's long and vigorous polemic against the thesis that the glycogen of the liver is reconverted into sugar in the normal course of metabolism, the physiologists are few who longer doubt that this is the case.] L. Garnier⁸ has reexamined the question of its postmortem conversion by the aid of quantitative determinations of the glycogen and glucose in the liver at various periods after death, and entirely supports the orthodox view, first enunciated by Cl. Bernard, that the glycogen is quantitatively changed into glucose. [While we do not doubt the general accuracy of this result, no evidence is given that the author avoided those errors in the estimation of glycogen pointed out by Pflüger in the paper mentioned above. It must be remembered, too, that, as Seegen⁹ has shown, the liver contains a nitrogenous substance, derived from the proteids, which reduces cupric oxid and is changed into reducing sugar by heating with dilute HCl; and Garnier probably reckoned this with the glucose. As to the manner in which the hepatic glycogen is converted into sugar, the opinion seems to be steadily gaining ground that the main factor is the vital activity of the hepatic cells, and not the action of an unorganized amylolytic ferment, although everybody admits that such a ferment can be extracted from the liver in small amounts, just as it can from other organs and from the blood.] Additional evidence in this sense is adduced by Cavazzani,¹⁰ who found that quinin sulphate

¹ Pflüger's Archiv, Band 74, S. 561.

² Ibid., Band 76, S. 1.

³ Loc. cit.

⁴ Pflüger's Archiv, Band 75, S. 113.

⁵ Ibid., S. 120.

⁶ Ibid., Band 76, S. 531.

⁷ Ibid., S. 543.

⁸ Jour. de Physiol. et Path. gén., tome i., p. 685.

⁹ Centralbl. f. Physiol., Band 13, S. 115.

¹⁰ Arch. f. Physiol., Suppl. Band, S. 105, 1899.

when injected into the veins caused a diminution in the amount of sugar formed in the liver, and also a diminution in the amount of heat produced in that organ, as shown by a fall in the hepatic temperature. Since it is well made out that quinin sulphate does not affect the activity of enzymes, he considers his result as strongly in favor of the view that the sugar is formed in the liver by the cells, and not by enzymes. Noël Paton¹ comes to the same conclusion from a comparison of the influence of chloroform on the amylolytic power of fresh liver and of liver which has been killed by being treated with alcohol.

Phloridzin-diabetes.—[Of all the theories which have been put forward to explain phloridzin-diabetes, only 3 need be considered as at present occupying the field: the elimination-theory, originated by v. Mering, which asserts that the primary cause of the glycosuria is an increased elimination of sugar by the kidneys; the theory of increased production of sugar; and the theory of diminished consumption.] M. Cremer² discusses these various views, and after a critical examination of them, supplemented by recent experiments of his own, arrives at the result that the elimination-theory is the only one that agrees with the facts. Among other novel points brought out by this investigation is the fact that the action of phloridzin on the kidney has no parallel in its action on other glands; for example, the amount of sugar in the milk is not increased by phloridzin.

Ray, McDermott, and Lusk³ state that the administration of phosphorus to dogs already rendered diabetic by phloridzin does not materially increase the proteid-metabolism, although everybody except Athanasii⁴ is agreed that phosphorus by itself does cause a marked increase in the consumption of proteid. On the other hand, in dogs poisoned with phosphorus phloridzin causes the usual sweeping out of the sugar of the body into the urine, and an increase in the proteid-metabolism. They conclude that phosphorus does not of itself directly increase the amount of proteid broken up, but does so indirectly by favoring the conversion of the carbohydrate-like radicle of the proteid molecule into leucin, tyrosin, and fat; and therefore necessitating an increased consumption of proteid. Athanasii,⁵ however, asserts that phosphorus does not cause any increase in the fat of the body. [But the experiments of Athanasii were made on frogs, and cannot, without further evidence, be allowed to offset the practically unanimous opinion of those who have worked with warm-blooded animals that there is such an increase.]

A. Biedl⁶ describes a new form of experimental diabetes produced by preventing the entrance of chyle into the blood by ligation of the thoracic duct or the establishment of a fistula. He supposes that the lymph of the thoracic duct contains a substance which influences the destruction of sugar in the organism.

Diabetic Coma.—Magnus-Levy⁷ discusses the relations of oxybutyric acid to diabetic coma. His results strengthen the widely accepted theory that the condition is essentially a poisoning by oxybutyric acid,

¹ Jour. of Physiol., vol. xxiv., p. 36.

² Zeit. f. Biol., Band 37, S. 59.

³ Am. Jour. Physiol., vol. iii., p. 139.

⁴ Pflüger's Archiv, Band 74, S. 511.

⁵ Loc. cit.

⁶ Centralbl. f. Physiol., Band 12, S. 624.

⁷ Arch. f. exper. Path. u. Pharmacol., Band 42, S. 149.

produced mainly either from fat or by synthesis in the muscles and glands. He recommends the treatment of diabetic coma with alkalies in very large doses (sodium bicarbonate, *e. g.*, to the amount of hundreds of grams). Even where there is no coma, in severe cases of diabetes with a large excretion of ammonia (mostly combined with oxybutric acid) in the urine, as much as 40 gr. of sodium bicarbonate should be given.

INTERNAL SECRETION.

Suprarenal Capsules.—J. J. Abel¹ has isolated as a benzoyl compound the constituent of the suprarenal capsule which causes the rise of blood-pressure when the extract is injected into a vein. He names it epinephrin. It is a base of alkaloidal nature, whose percentage-composition corresponds to the formula $C_{17}H_{15}NO_4$. The free base cannot be isolated without altering its physiologic effects, but the action of certain of its salts has been studied.

E. v. Cyon² states (in agreement with Cybulski and Szymonowicz, and in opposition to Oliver and Schäfer) that the vasomotor action of suprarenal extract is central and not peripheral, since in a dog under the influence of suprarenal extract section of the splanchnic nerves causes a marked fall of blood-pressure. [In strictness, however, this experiment, so long as it remains a purely qualitative one, only proves that the extract does not abolish the tonic action of the vasomotor center, which nobody has asserted that it did. A fall of pressure after section of the splanchnics might only indicate that the normal tone of that center was still maintained. It does seem quite clear from Cyon's paper that the fall of pressure was too great to be accounted for in this way. In any case the observation does not disprove the existence of a vasoconstriction of peripheral origin, which may coexist without central vasoconstriction. And it is not possible to explain all the facts by assuming a peripheral vasoconstriction; *e. g.* the constriction of the vessels of the eyeball produced by the local application of the extract, or its action as a local hemostatic in epistaxis] and the discovery of M. Lewandowsky³ that in the cat intravenous injection of the extract produces contraction of the smooth muscles of the eye (dilator pupillæ, retractor of the nictitating membrane, etc.) even after their connection with the central nervous system has been severed by excision of the superior cervical and jugular ganglia, and degeneration of the nerve-endings has occurred.

O. F. F. Grünbaum,⁴ on the assumption that the local action of the extract is proved, recommends its administration by the mouth as a hemostatic in hematemesis. Given in this way it produces no sensible rise of blood-pressure.

Hultgren and Andersson⁵ also criticise severely the results of Szymonowicz, in a paper of enormous length on the physiology and anatomy of the suprarenals, with a good critical digest of the literature.

Bardier and Frenkel⁶ announce that intravenous injection of supra-

¹ Zeit. f. physiol. Chem., Band 28, S. 318, 1899.

² Pflüger's Archiv, Band 74, S. 97, 1899.

³ Centralbl. f. Physiol., Band 12, S. 599; Arch. f. Physiol., S. 360, 1899.

⁴ Jour. of Physiol., vol. xxiv., p. 24.

⁵ Skand. Arch. of Physiol., Band 9, S. 73.

⁶ Jour. de Physiol. et Path. gén., tome i., p. 950.

renal extract (in the dog) causes first a diminution and then an increase in the flow of urine, the latter phase being accompanied and conditioned by a local dilation of the renal vessels.

The existence of secretory fibers for the suprarenal capsules in the splanchnic nerves has been rendered probable by the experiments of G. P. Dreyer,¹ who finds that the amount of active substance in the blood of the suprarenal vein is increased by stimulation of that nerve. [Such observations will, of course, be a little vague so long as merely physiologic methods of estimating the amount of active substance can be employed, and it is perhaps not quite so clear as might be wished that the changes observed were independent of the vascular changes produced by stimulation of the splanchnic.] At the same time, Dreyer's positive results cannot be considered as weakened by such negative results as those of H. Apolant,² who, in a series of [rather crude] experiments, found no change in the amount of secretion of the active substance when the capsules were stimulated directly by induction-shocks.

Thyroid.—[The nature and relations of the iodine-containing substance or substances in the thyroid have not yet been made out with the degree of certainty which is desirable.] F. Blum³ concludes that iodothyron does not exist preformed in the thyroid, since it can only be separated from the proteids of the gland by methods which in a chemie sense must be described as violent. The iodine-containing substance, according to him, is a toxalbumin incompletely saturated with iodine. He reiterates his view that the function of the thyroid is to intercept and neutralize certain poisons continually produced in the body and particularly noxious to the nervous system. The poisons are attenuated by being united with iodine; and even after the administration of inorganic iodids an iodizing process takes place in the thyroid.

P. A. Levene⁴ also finds that the proteids of the thyroid are among the substances which combine with iodine when potassium iodide is given.

The relation of the nervous system to the thyroid has been further elucidated by J. Katzenstein,⁵ who states that not only does degeneration occur in the thyroid after section of the superior and inferior thyroid nerves, according to observations previously recorded by him,⁶ but extirpation of the gland causes degeneration in the nerves from which the thyroid nerves arise, viz., in the vagus and its superior and inferior laryngeal branches.

The many-sided relations of the thyroid are further illustrated by the discovery by F. Wiener⁷ of microscopic alterations in the gland after the establishment of a biliary fistula. These alterations are quite different from the changes previously reported by Hürthle as following ligation of the bile-duct.

Pituitary Body.—E. A. Schäfer and S. Vincent⁸ state that the infundibular portion of the pituitary contains 2 active substances, one of which causes a rise and the other a fall of blood-pressure when injected into the veins. The former is soluble in salt solution, but insoluble in

¹ Am. Jour. Physiol., vol. ii., p. 203.

² Centralbl. f. Physiol., Band 12, S. 721.

³ Pflüger's Archiv, Band 77, S. 70.

⁴ Proc. Am. Physiol. Soc.; Am. Jour. Physiol., vol. ii., p. 15.

⁵ Arch. f. Physiol., S. 84, 1899.

⁶ Arch. f. Laryng., Band 5.

⁷ Centralbl. f. Physiol., Band 13, S. 142.

⁸ Jour. of Physiol., vol. xxv., p. 87.

absolute alcohol and ether; while the latter is soluble in salt solution as well as in absolute alcohol and ether. In confirmation of Howell,¹ they find that extracts of the hypophyseal portion of the pituitary body are inactive. They further agree with Howell that the active substances are not produced by the gray nervous matter of the infundibular body, but possibly by the glandular-looking cells described by Berkley.

Sexual Glands.—Loewy and Richter,² with the view of deciding whether the changes which follow castration are due to the loss of an internal secretion, have made exact experiments on the metabolism of bitches before and after that operation. They conclude that in the castrated animal the oxidative energy of the cells is lessened. This is shown by the fact that the oxygen-consumption sinks, even although proteid is laid on and the total amount of active protoplasm thus increased. This lessening of the oxidative power is due to the loss of ovarian substance, and is capable of accounting for the increase in the amount of body-fat. The administration of oophorin not only neutralizes the reduction in oxidative energy, but actually causes an increase in the gaseous metabolism to far above the original amount, while it has no effect on the metabolism of the normal uncastrated animal. Oophorin also brings about a notable increase in metabolism in the castrated male dog, while extract of testicle causes only a small increase. [The authors of this excellent paper claim, and with justice, that the proof of the specific action of oophorin is an important datum for a scientific theory of organ-therapy, since a similar substitution-therapy has not hitherto been exactly proved for any other organ, not even for the thyroid.]

NERVOUS SYSTEM.

General Physiology of the Nerve-cell.—G. Marinesco³ gives a good resume of modern results on the structure and certain of the functions of the nerve-cell. He shows that the theory of Waller, who concentrated in the cell-body all the trophic activity of the neuron, is incomplete. Not only does loss of function of the cell-body affect the nutrition of the axis-cylinder process, but loss of function of the axis-cylinder process reacts on the cell-body. He illustrates this conclusion [which, indeed, is by no means a new one] in a very interesting manner, and sums the matter up by saying that the functional and anatomic integrity of the neuron depends on the integrity of all its constituent parts, and of the neurons which carry to it functional excitations. The neuron, in short, lives by its function.

Hodge and Goddard⁴ relate in a preliminary communication some facts which point to the possibility of ameoboid movements of the dendrites of the cortical nerve-cells. [Should it turn out that this conclusion is well founded, certain modern neurologic theories would find a physical basis which they at present lack.]

Reflex Action.—[Physiologists and neurologists have long felt that the facts of reflex action in the frog could not be transferred wholesale to the higher animals and man.] B. Moore and H. Oertel,⁵ from a careful

¹ YEAR-BOOK for 1899, p. 963.

² Arch. f. Physiol., Suppl. Band, S. 174, 1899

³ Ibid., S. 89, 1899.

⁴ Proc. Am. Physiol. Soc.; Am. Jour. Physiol., vol. ii., p. xiii., 1899.

⁵ Am. Jour. Physiol., vol. iii., p. 45.

comparative study of reflex action after complete section of the cord in the cervical or upper dorsal region, have been led to the belief that the spinal reflexes in the higher animals are far more dependent on the upper portions of the central nervous system than is the case in the frog.

N. Uchinsky¹ adduces what he considers proof that even in the simplest reflex arcs there exist mechanisms which are easily susceptible of fatigue, and do not permit of the transference of a long-lasting excitation to motor nerves. In this fact he sees a physiologic proof of the doctrine at present dominant as to the connections between the successive neurons in a nervous path.

E. Flatau² has studied by means of Nissl's method the alterations in the motor nerve-cells of the spinal cord after certain amputations. In this way he has been able, in continuation of the work of Marinesco and others, to map out the spinal centers for the muscles of the forearm and hand.

Decussation of the Sensory Path.—H. Oppenheim,³ after an able discussion of the physiologic and especially the clinical evidence, comes to the conclusion [the original conclusion of Brown-Séquard, subsequently retracted by him] that the majority of the sensory fibers decussate in the cord soon after their entrance along the posterior roots. E. A. Schäfer,⁴ on the other hand, finds in the monkey, in general agreement with Mott, that while there is at first complete motor paralysis below and on the same side as the lesion in the cord, sensibility is only blunted and not destroyed on that side. On the opposite side there is neither sensory nor motor paralysis. [It seems almost impossible to reconcile the conflicting results on this point unless we assume that the extent of decussation of the sensory path in the cord is different in the various groups of animals, just as the completeness of the motor decussation in the medulla is liable to wide variations in man.]

Dorsal and Ventral Cerebellar Tracts.—Schäfer⁵ states that both of these tracts (Flechsig's tract and tract of Gowers) have their cells of origin in Clarke's column. Clarke's column is also related to the fibers of the pyramidal tract, after lesions of which many degenerated fibers may be seen running from the pyramidal tract toward Clarke's column, while none of the fibers of the pyramidal tract can be directly traced into the anterior horn.

Cortical Centers.—F. Goltz⁶ reports some most interesting observations on a monkey, which was carefully watched for 11 years after the removal by 2 operations of the cortex of the greater portion of the frontal and parietal lobes on the left side. The character of the animal, which had been studied for months before the operations, was entirely unaffected. All its traits remained unaltered. There was no loss of memory or intelligence. On the other hand, disturbances of movement on the right side were very noticeable up till its death. It learned again to use the right limbs in locomotion; but although they were not markedly weaker than those of the left side, their movements had a certain clumsiness, which was associated with a permanent diminution in the sensibility of the skin of these limbs. Muscular sensibility was also lessened. [This seems to

¹ *Centralbl. f. Physiol.*, Band 13, S. 4.

² *Arch. f. Physiol.*, 1899, S. 112.

³ *Ibid.*, Suppl. Band, S. 1, 1899.

⁴ *Jour. of Physiol.*, vol. xxiv., p. 22.

⁵ *Loc. cit.*

⁶ *Pflüger's Archiv*, Band 76, S. 411.

be opposed to Schäfer's¹ statement that the motor cortex has no sensory function, and in particular to his statement that after removal of the arm- or leg-area, or both, there is no loss of tactile sensibility in the corresponding region.] In actions requiring the use of only one hand the right was never willingly employed, and it evidently cost the animal a great effort to use it in such movements, but by special training it learned again to give the right hand when asked for it, and to make use of it for other purposes. Goltz asks significantly where the supporters of the theory of cortical centers would place the centers which were laboriously educated to carry out such movements of the right hand. He sees a close agreement between these results and those obtained by him in the dog.

Th. Ziehen² makes a contribution to the long-pending discussion whether homologous regions of the cortex have the same function in different groups of animals. Taking the position of the orbicularis center as a test, he comes to the conclusion that in the Primates, and among the Primates in the anthropomorphous apes and in man, this center has been pushed forward by the preponderating functional development, especially in 3 regions: the visual center, the arm-center, and the sensory and motor speech-center.

Capsular Hemianesthesia.—[The question whether hemianesthesia can be produced by a lesion in the internal capsule, which seemed long since settled in the affirmative, has again been placed in doubt,] and Sellier and Verger's³ results have strengthened the evidence on the negative side. They assert that it is not possible to limit the sensory fibers to the posterior third of the posterior limb of the internal capsule; or at least they cannot form a compact bundle there, since lesions of this region produce paralysis just as lesions farther forward in the capsule do.

Equilibration.—[We have had in the past year the usual large crop of papers on the relation of the semicircular canals and the otolithic apparatus to the maintenance of equilibrium, but it can hardly be said that we have advanced much nearer to a definite solution of the problem.] Hensen⁴ restates his position, that these organs have solely an auditory function, and keenly criticises the "statocyst" doctrine. Beer⁵ appears again as the champion of the statocysts. The observation of B. Rawitz⁶ that the peculiar rotatory movements of the so-called Japanese dancing mice are associated with marked anatomic peculiarities in the labyrinth is certainly a new fact in favor of the connection of the canals with equilibration and the sense of rotation. So is the relation between the degree of development of the canals in birds and the degree of agility in the coordination of their movements observed by J. P. Laudenbach,⁷ and the phenomena caused by the application of cocaine to the semicircular canals described by C. J. Koenig,⁸ and which resemble those seen by J. R. Ewald after extirpation of the canals.

On the other hand, a study of the comparative physiology of compensatory motions by E. P. Lyon⁹ has led him to the result that every form of

¹ Jour. of Physiol., vol. xxiii., p. 310.

² Arch. f. Physiol., S. 158, 1899.

³ Jour. de Physiol. et Path. gén., tome i., p. 757.

⁴ Pflüger's Archiv, Band 74, S. 21.

⁵ Ibid., S. 364.

⁶ Arch. f. Physiol., S. 236, 1899.

⁷ Jour. de Physiol. et Path. gén., tome i., p. 946.

⁸ Verhandl. d. physiol. Clubs zu Wien.; Centralbl. f. Physiol., Band 12, S. 694.

⁹ Am. Jour. Physiol., vol. iii., p. 86.

compensatory movement shown by vertebrates is also found in invertebrates, and not only in those with otocysts, as crustaceans, but also in those without otocysts, as insects. He therefore concludes [and rightly, if his observations are correct,] that if these motions have one common organ, it is not the semicircular canals nor the otocysts.

MISCELLANEOUS.

W. B. Hardy¹ has published a remarkable paper on the structure of cell-protoplasm, in which he shows that in the artificial coagulation or precipitation of colloid substances appearances are produced which are strikingly similar to those seen in animal protoplasm after death or the action of fixing-reagents. He accordingly suggests that the apparent structure of protoplasm is an artefact.

J. Loeb² has made a contribution of far-reaching importance to our knowledge of the meaning and mechanism of fertilization by the discovery that the unfertilized egg of the sea-urchin can develop in sea-water to which $MgCl_2$ has been added in a certain proportion, just as if a spermatozoon had entered the egg. From his experiments he deduces the conclusion that the unfertilized egg of the sea-urchin contains all the elements essential for development, and that "the only reason which prevents it from developing parthenogenetically under normal conditions is the constitution of the sea-water."

Among the many other important investigations which the limits of our space prevent us doing justice to we may mention those of Burdon-Sanderson³ on the electric response of muscle to stimulation; of Gotch and Burch⁴ on the electric response of nerve to stimulation; of Loeb⁵ on the relation of ions to rhythmic muscular contraction; and of Arrhenius⁶ and B. Friedländer⁷ on the relation of certain cosmic influences to physiologic phenomena.

¹ Jour. of Physiol., vol. xxiv., p. 158.

² Am. Jour. Physiol., vol. iii., p. 135.

³ Jour. of Physiol., vol. xxiii., p. 325; vol. xxiv., p. 5.

⁴ Ibid., vol. xxiv., p. 356.

⁵ Fick's Festschrift, 1899.

⁶ Skand. Arch. f. Physiol., Band 8, S. 367.

⁷ Verhandl. d. Berlin. physiol. Ges.; Arch. f. Physiol., S. 570, 1899.

LEGAL MEDICINE.

By WYATT JOHNSTON, M. D.,
OF MONTREAL, CANADA.

Epitome.—By the death of Maschka on Feb. 5, 1899, we lost one of the most prominent medicolegal authorities. As a result of last year's agitation, we note the passage by the French Chamber of Deputies of the Cruppi law, by which, in every criminal investigation, the State allows the suspected person to choose an expert to investigate the case in his behalf, at the expense of the government. The expert must be selected from a list revised annually by the courts. Steps have also been taken in France and Canada to provide a special diploma to qualify for medicolegal practice. The Christian scientists have come into collision with the law in manslaughter cases. The subject of rigor mortis has been studied from a purely physical standpoint by A. Lacassagne, with most interesting results. Babes and E. Malvoz have published important new observations on the relations of infection and putrefaction to legal medicine. The announcement by Beskreda of hyperleukocytosis in connection with certain toxic conditions opens a new and interesting field of inquiry.

Criminology.—The voluminous literature of the subject has this year contained little that is novel or important. The pleading of Brower,¹ that asexualization is the most promising means of reducing crime, has been put on a practical basis by the suggestion of McCassy,² that criminals, especially those imprisoned for rape, should be offered their liberty at any time on condition of submitting to castration previous to discharge.

MEDICAL JURISPRUDENCE.

The **Cruppi law**, referred to above, has met with a good deal of criticism. Leredu³ claims that the defence should not be limited in their choice to an official list of experts. Motet⁴ considers that the new law will lead to constant differences between experts and prove doubly costly to the State.

Ducor⁵ insists upon the necessity of a higher standard of technical knowledge for experts. The text of the law is given in *Sem. méd.* of July 5, 1899.

L'exercice de la Medecine et le Charlatinisme is the title of an important monograph by P. Brouardel, already published partly in the

¹ Jour. Am. Med. Assoc., June, 1899.

³ Ann. d'Hyg. pub., p. 442, 1899.

⁵ Rev. de méd. lég., Jan., 1899.

² Ibid., Dec. 3, 1898.

⁴ Ibid., Aug., 1899.

*Ann. d'Hyg. pub.*¹ Though specially relating to practice under French laws, it contains much that is of general interest. It is in the same form as the rest of the series by the same writer. The chapters upon accidents in connection with anesthetics, narcotics, and erroneous prescriptions are specially interesting.

The law in its relation to physicians is discussed by A. N. Taylor,² L.L.B., in a series of articles treating of legal medicine from the forensic standpoint, which form a valuable addition to the literature of the subject.

W. A. Purrington³ has published a work entitled **legal decisions affecting physicians, dentists, druggists, and health-boards**, the law in relation to dentistry being the part most fully dealt with.

Grassl⁴ records 2 cases in which a conviction for assault was obtained against surgeons who **operated without permission**. In 1 case no objection was made until the physician took legal proceedings for collecting the fee for the operation in question.

R. M. Lizys⁵ discusses the French statutes relating to **malpractice**.

Carl Stoss⁶ reviews the **legal questions** regarding **surgical operations** and **medical treatment** in the light of cases which have come before German courts.

DEATH AND CONDITIONS AFFECTING DEAD BODIES (THANATOLOGY).

On the Cause and Varieties of Rigor Mortis.—A. Lacassagne and E. Martin⁷ state that the determining factor in the onset of rigor mortis is the drying of the muscles and tissues. Those which first lose the fluids of the body by hypostasis—*e. g.*, jaw, sternomastoid—become rigid earliest. If the body is inverted and placed on the face, the order is reversed. In artificial desiccation by ligating with an Esmarch immediately after death the depleted limb becomes rigid before the rest of the body. Chemic dehydrating agents produce similar effects. By post-mortem injection of fluids Brown-Séquard and Richet were able to retard the onset of rigidity. [The above statements do not explain why the heart is one of the first parts of the body to become rigid.]

A New Sign of Death.—The influence of respiration and putrefaction on the radiography of the lungs. S. Ottolenghi⁸ finds that (in accordance with Bongardes's statement) dead lungs are more opaque to the x-rays than living ones, and show darker at the borders, but the difference is not sufficient to give us decisive results in the case of persons recently dead (24 hours), and only becomes well marked with the onset of decomposition. Gas-formation in dead lungs gives rise to clear areas not likely to be confused with the appearances during life.

Ehrle⁹ reports the **rapid destruction of a child's body** after infanticide. The body was buried in sand, near the surface, in unusually hot weather. The surface of the body was charred slightly and the entire interior converted into a blackened pulpy mass in about a week.

¹ Paris, 1899, Baillière.

³ New York, E. B. Treat, 1899.

⁵ Paris Theses, 1899.

⁷ Arch. d'Anthrop. crim., May, 1899.

² N. Y. Med. Jour., 1899.

⁴ Friedreich's Blätter, July, 1899.

⁶ Lehmann, Berlin, 1899.

⁸ Viertelj. ger. Med., 1899.

⁹ Correspondenz-Bl. d. Württ. Aerzte, No. 26, 1899.

Subpleural Ecchymoses in Death from Primary Heart-failure.—A. Schulz¹ points out that with a strophanthin preparation, which in its essential action is primarily a cardiac depressant, very numerous and well-marked subpleural and subpericardial ecchymoses are constantly present after fatal doses.

Postmortem Contractibility of Muscles to Electricity.—J. Babinski² states that contraction is lost first in the facial muscles. These pass through a phase in which the faradic response is lost, but the voltaic remains, with the normal formula inverted ($PFC > NFC$ and $NOC > POC$), thus being analogous to the reaction of degeneration. The irritability persists in the muscles after disappearing from the terminal nerve-filaments.

D. Mirte³ has studied **secondary postmortem atelectasis** of the lungs of the newborn. After death the atelectasis tends to extend to the deeper parts of the lungs from the surface. In premature fetuses aeration is scattered in minute areas at various points in the lungs. In lungs which have breathed some days the extension of postmortem atelectasis is very slow. In lungs with inflammatory lesions it occurs more easily. In inflated lungs it occurs readily and early, and these do not have the central aerated nucleus of lungs which have breathed.

H. Schmidt⁴ concludes, in a monographic article upon **drowning**, that the only reliable appearances are those in the digestive and respiratory organs, the tympanum, and the blood. The signs indicating the duration of immersion are indirectly of importance. It is important to recognize the injuries to which drowned bodies are subject after death. The association of a fatal wound with drowning usually indicates suicide. In doubtful cases giving a negative result it should be stated simply that the examination has not shown indications of violence.

Edema of the laryngeal folds in immersed bodies, according to M. Richter,⁵ is not a certain sign of drowning, but is not as easily produced postmortem as has been stated. Out of 18 experiments with children's bodies edema was found 8 times. With extirpated larynxes it occurred 34 times out of 77 experiments. In 23 immersed bodies it was found 9 times. Thus, it is not characteristic of drowning, but occurs postmortem when the circumstances are favorable. Once present, it does not disappear with the onset of putrefaction, and does not require long immersion for its production.

Focke⁶ discusses thoroughly the medicolegal bearings of **death from tetanus**. The autopsy findings alone are inconclusive unless the specific bacillus is demonstrated by inoculation or culture-method; and even in this case the proof is only absolute if the material is obtained from deep tissues or foreign bodies in them, as the surface of tissues is exposed to external contamination. The connection of the tetanus with a well-defined injury is necessary.

Medicolegal Pathology of Brain-injuries.—Adler⁷ lays stress upon the following points: Autopsy-results alone are insufficient to establish a diagnosis of fatal concussion of the brain without knowledge of

¹ Viertelj. ger. Med., Apr., 1899.

³ Acad. d. Sc. med. di Palermo, 1899.

⁵ Wien. klin. Woch., 25, 1899.

² Soc. de Biol., No. 15, 1899.

⁴ Friedreich's Blätter, 1 and 2, 1899.

⁶ Viertelj. ger. Med., Suppl., i., 1899.

⁷ Ibid.

the symptoms. Instant loss of consciousness he considers characteristic. The injury must be exceptionally violent. In cases complicated by alcoholism the question is whether the amount taken could have caused death within the time elapsed. Pressure-symptoms from intradural hemorrhage begin some hours after the injury. Traumatic hemorrhages are usually cortical, and spontaneous hemorrhages deep-seated. The traumatic are usually smaller and multiple; deep traumatic hemorrhages are usually associated with meningeal hemorrhage. Lacerations of brain-substance indicate alterations of pressure in the cranial cavity. Projectiles of small caliber may lodge in the brain without causing unconsciousness. Brain-injuries never in themselves cause suppuration. In another article¹ he pronounces it doubtful whether diabetes ever really results from brain-injury, and discusses at length the medicolegal symptomatology of brain-injury.

Corrière² describes the **alterations of blood in experimental asphyxia**. The most notable observation was in animals asphyxiated by CO₂ in which a great number of eosinophile cells were presented.

Alterations of the Nerve-tissues in Death by Starvation.—S. Placzek³ found that in rabbits dead from starvation the Nissl bodies were greatly diminished, but still present. He found by the Marchi stain degenerative changes in the posterior columns. [His results differ from those of Schaffer and Jacobson, who studied the question separately, with mutually divergent results.]

Spinal Changes in Death by Hunger in Man.—Placzek,⁴ referring to his previous article, says that the degeneration described there was not recognizable by Weigert's method. He reports the result of examination of a case of death by hunger in an insane woman. [Body showed a decided panniculus adiposus.] There was a distinct wasting of the Nissl bodies.

Gaelano Corrado⁵ reports the occurrence of striking **changes in the nerve-cells** of animals killed by **electric shock**. These consist in a deformed, eroded, ragged appearance of the contour, with granular and vacuole formation and disturbed arrangement of the chromatin.

A New Anatomic Sign Concerning Death by Burning.—F. Strassmann,⁶ in 2 cases in which an extradural blood-extravasation was at first regarded as proof that an existing fracture of the skull had occurred during life, was able to demonstrate the contrary from the circumstance of the blood-clot being surrounded by melted fat. The occurrence of hemorrhages postmortem within closed cavities, through the effects of heat, has already been explained.⁷ Strassmann was able experimentally to reproduce the condition.

Harvey Littlejohn⁸ reports 3 cases of fatal burning, in one of which pseudohemorrhage of the meninges from combustion occurred. In another case, a woman of 82, the left leg was completely destroyed up to the knee, although the fire had lasted only $\frac{1}{2}$ hour.

Lacassagne and E. Martin⁹ have applied the term **hepatic doci-**

¹ Viertelj. ger. Med., Suppl., i., 1899.

² Soc. de Biol., Feb. 11, 1899.

³ Viertelj. ger. Med., Apr., 1899.

⁴ Ibid., July, 1899.

⁵ Acad. Medico-Chir. di Napoli, No. 52, 1898.

⁶ Viertelj. ger. Med., Jan., 1899.

⁷ See YEAR-BOOK for 1899, p. 973.

⁸ Edinb. Med. Jour., May, 1899.

⁹ Arch. d'Anthrop. crim., Jan., 1899.

masia to denote the test for glycogen and sugar in the liver. They find that while it is present in rapidly fatal cases of poisoning, it is absent in conditions having a prolonged death-agony. In alcoholic poisoning it is absent, and also in diabetics, unless these die suddenly when in fair health. A number of medicolegal applications are instanced, for which the original article should be consulted.

Facies Sympathique in Hanging.—E. Martin¹ concludes that : 1. In hanging a peculiar appearance of the face exists, which he calls *facies sympathique*. 2. Pupillary inequality is a condition produced during life, permitting the affirmation that the hanging has not been seen on a dead body. 3. The sympathetic lesion is probably the cause of the lividity through vasomotor paralysis and dilatation.

A case² is recorded of the suicide of a man by filling his mouth with gunpowder and setting fire to it. He was conscious on reaching the hospital, but died in 12 hours. The autopsy showed laceration of the throat, esophagus, and lung-alveoli, with interstitial emphysema.

Suicide in Edinburgh.—Harvey Littlejohn³ gives a statistical and medical review of experience in Edinburgh during the past 45 years.

Schnehardt⁴ reports an **unusual injury of the neck in hanging by an iron wire**. A man was found hanging by a wire taken from a funeral wreath off his wife's bier. The furrow on the skin was 5 mm. wide.

Two Cases of Suicide in the Insane.—L. Scabia⁵ states that in both cases a quantity of pebbles was swallowed, producing intestinal ulceration. One case recovered after passing 357 pebbles, weighing together 774 gm. The other swallowed 20 stones and several buttons and had 7 submucous ecchymoses of the stomach and esophagus, and died of bronchopneumonia.

Payr⁶ observed a fatal case of **fat-embolism after brisement forcé** of a contracted knee-joint. A complete status thymicus and lymphaticus existed in this as well as in the 4 other recorded cases. In such cases the heart is not able to withstand fat-embolism, and the bones become rarefied and fattily degenerated from prolonged stay in bed, which makes this a serious intervention.

Differential Diagnosis of Traumatic and Spontaneous Cerebral Hemorrhage.—Schilling⁷ gives the following criteria: Spontaneous hemorrhages are central, and extend from within outward, usually from branches of the Sylvian artery, usually from a single source. Pathologic changes are found in the vessels of the brain and in the general circulation. The heart or the kidneys show pathologic changes. In traumatic hemorrhages without fracture of the skull, dural, subdural, or subarachnoid hemorrhages occur in a single spot or at several points. Traumatic central hemorrhages are accompanied by meningeal hemorrhages. The absence of surface hemorrhages forms a very important indication against trauma. They are caused by contraction and expansion of the cranial cavity.

¹ Arch. d'Anthrop. crim., Mar., 1899.

² Jour. Am. Med. Assoc., Jan. 13, 1899.

³ Ibid.

⁴ Aertzl. Sachverst. Zeitung, No. 12, 1899.

⁵ Rivistad. med. leg., Mar., 1899.

⁶ Münch. med. Woch., No. 28, 1898.

⁷ Aertzl. Sachverst. Zeitung, Mar., 1899.

WOUNDS AND DISABILITY FROM INJURY (TRAUMATOLOGY).

Zacher¹ has reprinted, with explanatory text, the English, Swedish, Norwegian, Danish, Austrian, Russian, Finnish, Swiss, French, and Italian statutes dealing with the plans for **State insurance of laborers** against accident and disease.

A general medicolegal study of the subject of **posttraumatic disease** has been made by A. Crouhel.²

Estimation of the Effects of External Injury upon Existing Disease in Accident-insurance Practice.—F. Kiderlen³ points out that: 1. Existing disease may be made worse directly or indirectly by external injury. 2. Owing to the existing disease the injury may have unusual consequences. 3. It may increase the effect of injury upon earning power; *e. g.*, a deaf workman may suffer greater loss from the amputation of a leg than a healthy man would.

G. Haag has published⁴ a convenient graphic schedule for estimating the **amount of disability** caused by the commoner forms of injury. His diagram (see Plate 9) indicates in percentages the loss of earning power from permanent disability of various parts of the body. By the government insurance system about 60% compensation is allowed usually in the form of an annuity for disability persisting after 3 months.

Lacy Barrett⁵ reports a peculiar **gunshot wound** caused by the ramrod of a muzzle-loading shotgun passing through the left side of the forehead, coming out through the middle of the left parietal bone of a 15-year's-old boy. After the accident he could walk, but could not speak nor move the right hand. In the hospital he became comatose; left pupil dilated; good recovery ensued.

Hemorrhagic Traumatic Pachymeningitis.—C. F. v. Vlentén⁶ has studied clinical material obtained from Köhl, and concludes: 1. Appearances analogous to pachymeningitis hæmorrhagica occur from organization of primary hemorrhages in the subdural spaces. 2. The organization-tissue at first tends to enclose the coagulum, and then extends inward concentrically. 3. Recurrent bleedings do not occur; the process is not progressive, but tends to cicatrization. 4. Animal experiments are not strictly analogous to general pachymeningitis. 5. Traumatic meningitis is not identical with spontaneous. The bleeding may be from the dura or the pia, or both.

Drenkhahn⁷ discusses the medicolegal questions arising in connection with **injuries of the thoracic duct** in a monographic article, too long for abstraction here.

Lung-disease from Accidental Inhalation of Nitrous-acid Fumes.—Becker⁸ states that a previously healthy workman, aged 30, employed in etching bronze, carried a pot of fuming nitric acid, 80 cm. wide, a distance of 10 feet and inhaled the vapor, which caused immediate coughing and expectoration of fluid blood for 30 minutes. Next day only blood-tinged sputum. On the third day hemoptysis of clear blood

¹ Die Arbeiterversicherung Ausland, Berlin, 1899.

² Thesis, Lille, 1899.

³ Viertelj. ger. Med., Jan., 1899.

⁴ Munich, 1899.

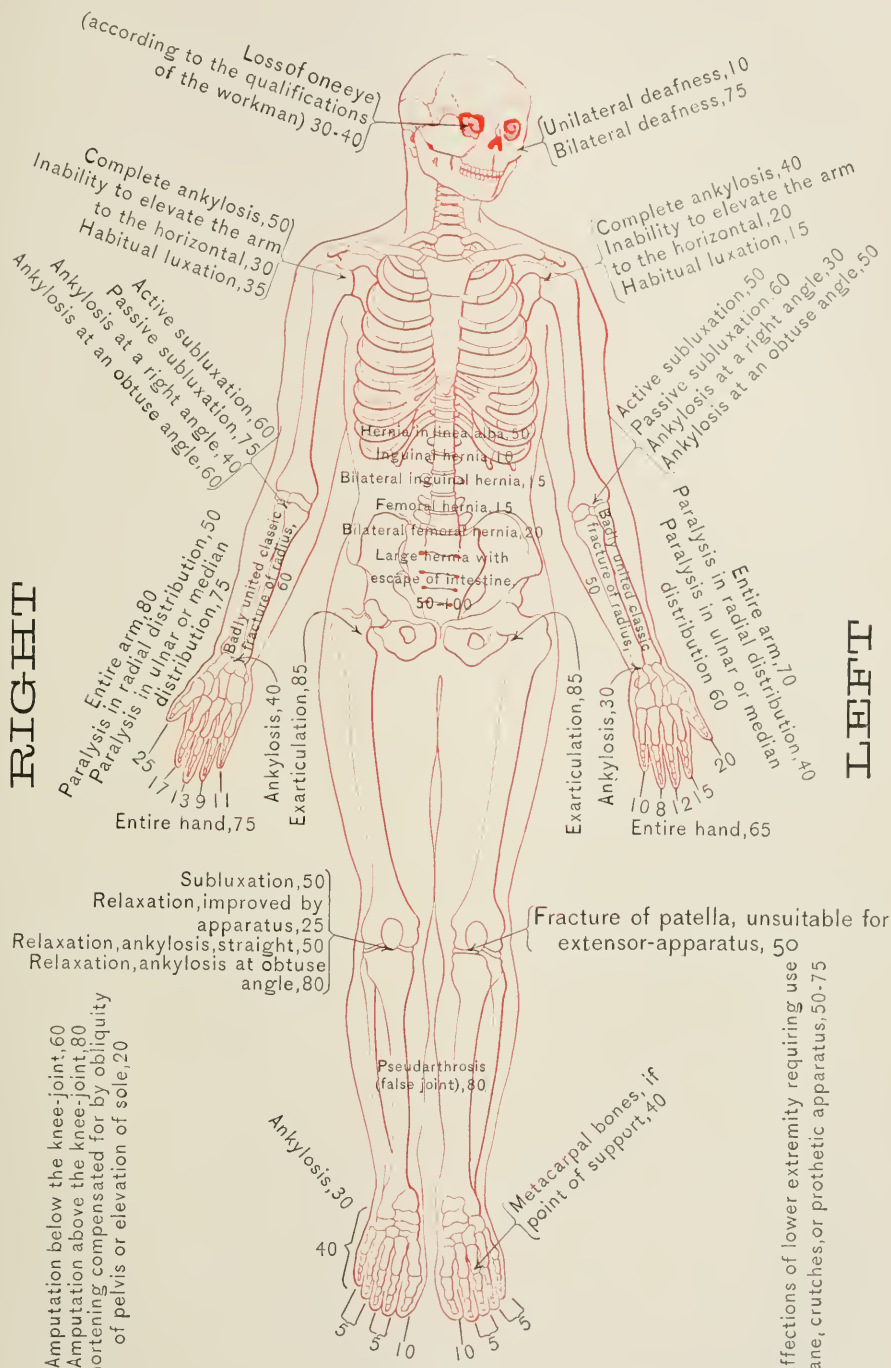
⁵ Lancet, Jan. 7, 1899.

⁶ Dis., Bonn., 1898.

⁷ Friedreich's Blätter, 2 and 3, 1899.

⁸ Aertzl. Sachverst. Zeitung, 13, 1899.

PLATE 9.



No difference in estimates for right and left lower extremities

G. Haag's graphic schedule showing the percentage-loss of earning-power through permanent partial disability. (Compensation allowed equal to 60% of disability under the state system of compulsory insurance of workmen.)



recurred; but the sputum remained bloody for 8 days. Work was resumed after 4 weeks, and kept up for 3 months, with cough and pain in the chest, at the end of which time the sputum was again bloody. At the end of 6 months there was bronchial catarrh, liable to exacerbations.

Rupture of Internal Organs from Contusions.—C. Seill¹ gives a very interesting statistical study of the nature and comparative frequency of the lesions of different organs.

Pretz² reports 2 cases of **traumatic entry of air into the knee-joint**. The first was that of a man caught beneath the fender of a tram-car, and in a state of profound shock. No fractures. The skin was torn for 25 cm. over the left knee, the knee-joint being quite tympanitic. The joint was freely movable. Recovery. In the second case the patient got the knee caught beneath a trap-door, which was forcibly closed. The skin was crushed and torn for a hand's breadth above the knee. The knee-joint was tympanitic and crepitant to the touch. The joint was freely movable. Emphysema lasted 4 days. Sepsis ensued and proved fatal. In the knee-joint blood and pus were found. Only a few cases are recorded.

Cranial Defect from Fractures during Childhood.—H. Chiari³ believes that fractures of the skull not infrequently remain united, not only when compound and infected, but also when subcutaneous. This is due to slight tendency to form callus in the cranial bones and to the tendency of the edges to become displaced. Separation of periosteum and dura from the edges by hemorrhage or enclosure of soft tissues is another cause. Atrophy and absorption of edges may also occur, leaving a wide cleft. In young children there is a tendency to separation of the edges from relatively greater effusion and the distensibility of the cranium. Fractures during the first 3 years tend to end in defects. The meningocele formations exaggerate this tendency (traumatic spurious cephalohydrocele). Very few authentic postmortem records are available. Chiari reports 2 postmortems in such cases, 1 from the effects of forceps.

Varices and Accident.—Wagner⁴ concludes that: 1. Varices cannot originate from trauma. 2. Existing varices may be aggravated from the effects of injury. 3. Existing varices may be developed more rapidly from therapeutic measures rendered necessary by accidents. 4. Such varices tend in some cases to induce flat-foot. 5. The aggravation of varices should, under the above circumstances, be estimated as one of the effects of the accident.

W. Herzog⁵ finds that **traumatic gangrene** after severe crushing injuries, or even subcutaneous ones, is due to lesions of the inner coats of the arteries.

Gangrene of Skin.—G. Riehl⁶ reports 4 cases of self-inflicted injury of this nature, 1 by inunction of concentrated brine, 2 by scratching and washing with green soap and acetic acid, and 1 by unknown methods. If the history does not reveal the origin, certain objective appearances are of value: the irregular, jagged edges of the spots, often with deep projections of normal skin not corresponding either to the

¹ Viertelj. ger. Med., Oct., 1899.

² Deutsch. Zeit. f. Chir., Band 48, S. 591.

³ Prag. med. Woch., 11-13, 1899.

⁴ Aertzl. Sachverst Zeitung, 11, 1899.

⁵ Beiträge z. klin. Chir., Band 23, S. 643.

⁶ Wien. klin. Woch., 14, 1899.

course of nerves or vessels, and the varying depths of the loss of substance should direct attention to this.

Forensic Significance of Suppuration of Chemic Origin.

—Moritz Mayer¹ refers to cases recorded of purulent inflammation caused by mercury, gray oil, silver nitrate, croton oil, cantharides, injections of opium and morphin, applications of turpentine liniment, and tartar emetic.

Grashey² reports a case in which **actinomycosis** infection was conveyed by the kick of an ox in a woman who was kicked in the jaw.

Trauma and Tuberculosis.—Lannelongue and Achair³ report that experimentally tuberculized animals showed no tuberculous lesions at the site of trauma on the abdominal walls.

E. Schäffer⁴ reports a case in which a previously healthy boy of 7 developed this condition the day after receiving a blow on the forehead. Examination of the lump showed no grounds for supposing that the trauma had caused dissemination of the tuberculous poison. Cases requiring special care are: 1. Fractures and their results. 2. Cellulitis of all kinds in patients over 40. 3. Deep injuries of young persons, with division of tendons, muscles, and nerves. 4. Hernias. 5. Simulation doubtful; cases exaggerated. 6. Traumatic neurosis, pleurisy, etc.

Weibel⁵ reports the case of a boy of 6 years, apparently healthy, who took sick 2 days after a blow on the head. The autopsy showed a caseous primary focus in the bronchial glands.

Urban⁶ found that in the animals infected with tubercle-bacilli, on breaking the bones and dislocating the joints, the joints become tuberculous, but the diaphyses remain free. Small wounds are more liable to infection than large ones.

Traumatic Origin of Tumors.—Ravel⁷ has studied the development of melanosarcoma after injury to nevi, and reports a case in which contusion of a mole on the upper arm was followed by sarcoma, and death in 3 months.

Fatal Sarcoma after Injury.—Obergtachlan⁸ relates the case of a previously healthy strong man, who, on pushing sideways on a heavy wagon, on July 1, 1897, felt pain in the right lower abdomen, but worked till July 26. He consulted a physician on July 4, who found a pigeon-egg-sized muscle-hernia or muscle-rupture. In August there was a fist-sized sarcoma. Death took place on April 4, 1898.

Lähr⁹ reports 4 recent cases of **brain-tumors after head-injuries**. The first case was that of a woman of 33, syphilitic, who struck her head against that of her little child. There were hemiparesis and pressure-symptoms 4 months later, with Jacksonian epilepsy. Death in 8 months. There was gumma-formation in the cortex in the part corresponding to the site of injury in the right supramarginal gyrus. The second case was that of a locksmith, aged 23. During an epileptic attack he struck his head against a piece of machinery. Pressure-symptoms appeared in 4 months and death occurred in 6 months. There was a gliosarcoma of the frontal lobe beneath the site of injury. The third

¹ Viertelj. ger. Med., Apr., 1899.

³ Gaz. des Hôpitaux, No. 54, 1899.

⁵ Münch. med. Woch., May, 1899.

⁷ Diss., Kiel, 1899.

² Unfallvers. Praxis, 22, 1899.

⁴ Monats. Unfallheilk., 6, 1899.

⁶ Ibid., Mar. 14, 1899.

⁸ Unfallvers. Praxis, Mar., 1899.

⁹ Charite Annalen, xxiii.

case was that of a 33-years-old woman, who struck her occiput in falling from a ladder. Pressure-symptoms and paralysis were present 1 month after; death in 3 months. There was a sarcoma of the corresponding region of the right occipital lobe. The fourth case was that of a 41-years-old workman, in whom, 5 months after repeated blows on the head, sarcoma of the frontal lobe was diagnosed.

Traumatic Gastrectasia.—Kocher¹ reports the case of a man of 34, who fell 2 meters, striking his right side on a ship's bulwark. Intestinal obstruction occurred, subsiding without operation, but followed by gastrectasia, recognized 3 years later. The symptoms were relieved by gastroenterostomy. Extensive perihepatitis and adhesions about the region of the liver were found at the operation.

Ulcer of Stomach caused by Trauma.—C. Thiem² tells of a healthy man of 47, who was struck in the epigastrium by the snout of a cow, and who felt immediate pain, transitory in nature. Eleven days after he vomited blood, became quite anemic. Some tenderness and fullness remained in the epigastrium 9 months later. Improvement followed dietetic treatment. Thiem thinks this was not purely autodigestion, but that autoinfection of the stomach-wall took place when it was bruised.

Dovie³ reports the case of a man who was kicked by a horse in the right side of the abdomen. Obstinate constipation and vomiting followed. Laparotomy showed a constriction at the pylorus. Gastroenterostomy was followed by improvement.

Lewie⁴ states that when empty the stomach is not exposed to direct injury. The full stomach, on the contrary, lies directly against the anterior wall. This does not suffice in itself to explain gastric ulcer, conditions of anemia, etc., being more likely, *chronic traumatic* effects, such as result from tight lacing and repeated pressure. [These are really not traumatic effects in a legal sense as regards accident.] Twelve cases illustrating the direct effects of trauma are given; also some cases from strains during exertion, etc. Some experiments upon animals are also reported. The pressure of corsets is regarded by Rasmussen as an important factor.

Kronlein⁵ reports 2 cases. The first case was that of a trainer, a man of 24, who fell from a horse, striking the pit of the stomach on the pommel of the saddle. Four weeks later he began to vomit after eating. Hematemesis was present in 4 months. Resection of the pylorus was done at 8 months. Death. The second case was in a workman of 48, who jumped from a hayrick, and struck a fork against the pit of the stomach. No ill-effects immediately. Next night there was severe pain in the left side; unable to work. The following week there were loss of appetite, vomiting, and tenderness near the xiphoid. Cure followed laparotomy and resection of the pylorus. The gradual onset is explained by supposing that the injury was beneath the mucosa.

Brandenberg,⁶ in studying **hernia and injury**, found that out of 3052 laborers 80.2% were found predisposed, and 19.8% not so. Of those disposed, traumatic hernia occurred in only 0.32%.

¹ Aertzl. Sachverst. Zeitung, 5, 1899.

³ Diss., Berlin, 1898.

⁵ Mittheil. a. d. Grenzgeb., Band 4, 1899.

² Monats. f. Unfallheilk., May, 1899.

⁴ Diss., Kiel, 1898.

⁶ Correspbl. Schw. Aerzte., Mar., 1899.

Strassmann,¹ in discussing **abdominal hernia and trauma**, reports a case from carrying a too heavy sack, cites several cases, and states that he does not think the established proof of predisposition should negative the claim when the connection of result and exciting cause is clearly made out.

Noack² investigated the subject of **peritoneal adhesions** after severe compression of the abdomen, causing severe colic and constipation. He reports 4 new cases, the interval from injury being 1 to 10 years.

Hemorrhagic Pancreatitis due to Traumatism.—Ferrand³ reports the case of a man of 39, who died 6 months after receiving a violent blow in the epigastrium. In the region of the pancreas 2 to 3 liters of bloody fluid were effused, the pancreatic tissue being infiltrated with blood and sclerosed. The organ was enlarged.

Isolated Injury of Pancreas.—E. Stern⁴ reports 2 cases, one that of a 37-years old navvy, who was crushed between the buffers of a railway train; the other that of a man of 38, who was run over by a carriage. The first case was fatal after 7 months. A large cyst had formed, which led to local inflammation and a fistula leading to the left pleura. In the other case death occurred 4 days after the injury, and the gland was found divided transversely.

Cyst of Pancreas following Trauma.—I. von der Haau⁵ relates the following case: Dec. 3, 1895, I. D. I., a boy of 9, while coasting, was struck in the region of the stomach by a playmate's sled. Shock, vomiting, and pain in the epigastrium followed. After 3 months there was noted a large tumor in the epigastrium. Aspiration gave fluid with amyloid properties. Three hours afterward symptoms of acute peritonitis led to immediate opening of the abdomen, but all trace of the cyst had disappeared. Good recovery, with reappearance of the cyst in 3 weeks. Second operation resulted in fistulous opening, which soon healed. [This is the only case reported in a child.]

C. Thiem⁶ contributes cases illustrative of the **gynecologic effects of accident**. He reports 2 cases of pelvic inflammation: 1. Prolapse of vagina, ascribed to accident—lifting heavy sacks; felt pain in abdomen—only asked for medical advice 3½ months later. Disallowed. 2. Retroversion; healed inside of the 13-weeks limit, which precludes disability claims; pain came on during act of lifting a heavy basket. No traces of injury were left.

C. Thiem⁷ also states that **dilatation of the oviducts** cannot be considered an effect of accident. In one alleged case, caused by carrying a basket, pyosalpinx was present.

F. H. Kornfeld⁸ discusses the decisions of the German Reichsversicherungsamt in reference to **gynecologic effects of accident**. In a case of alleged accidental prolapse the judgment of the first court was reversed on appeal, on the grounds that neither the accident nor the connection of the condition with an accident had been proved. The woman

¹ Aertzl. Sachverst. Zeitung, Heft 10, 1899.

² Mittheil. a. d. Grenzgeb., Band 4, Heft 5.

⁴ Viertelj. ger. Med., Oct., 1899.

⁶ Monats. f. Unfallhik., Jan., 1899.

³ Sem. méd., Nov. 23, 1898.

⁵ Jour. Am. Med. Assoc., July 8, 1899.

⁷ Ibid., Sept., 1899.

⁸ Ibid., Jan., 1899.

complained of a sudden pain while working a hand-pump, and had old pelvic disease.

Bruns¹ reviews recent literature on **nerve-disorders due to injury**.

Müller² tells of a **case of tabes following trauma**. A stableman, aged 29, was knocked down by a horse, which trod on his breast and broke his right leg. Symptoms began 4 months later. The patient had had a slight venereal infection 10 years before.

E. Trommer³ reports cases [alleged] of **tabes after trauma**, in one of which symptoms appeared in a man of 42, 8 weeks after crushing of his left foot. In the other case exposure to cold was the history. Mendel,⁴ however, states emphatically that tabes cannot ensue from injury, though it may be aggravated as a result. He gives very full citations of the literature on the subject.

Loewe⁵ relates cases of **loss of deltoid muscle**, with preservation of power to raise the arm. He reports 3 cases.

W. Wagner and P. Stolper⁶ have written a very full and instructive monograph upon injuries of the vertebrae and spinal cord.

Tillman⁷ reports experiments with apparatus to imitate conditions of concussion of the brain. He explains the lesions as due to changes in volume and to the differences in the specific gravity of the cranial contents.

E. Levy⁸ makes report of 4 cases of **metastatic meningitis after injury**, in which all local causes, such as head-injury, ear-disease, etc., were excluded, and with no metastases elsewhere in the body. One case has been previously reported by E. v. Hoffmann.

S. Paget⁹ has observed **voracious hunger and thirst after injury or disease of the brain**. He gives 11 cases. Diabetes was excluded in all.

Medicolegal Relations of Traumatic Hysteria.—Peirce Bailey¹⁰ gives a useful and practical discussion of the causes leading to confusion in assigning damages in this class of cases.

Traumatic Nerve-diseases in Children.—P. Schuster and K. Mendel¹¹ report a case of traumatic hysteria in a girl of 11, 1 of astasia abasia in a girl of 12, and 2 of hysteric monoplegia in girls of 15—all following trauma.

Paralysis Agitans from Trauma.—R. Krafft Ebing,¹² out of 110 cases, found 7 (4 males and 3 females) in which trauma appeared to be the cause. In 1 case an interval of 6 years elapsed before the onset of the tremor. In all of the above 7 cases the tremor began at the site of the injury. In the remainder it began at a remote point, usually in the upper extremity.

Köhler¹³ reports a case of a man, of independent means, 61 years old, who fell on his right arm in March, 1893. Tremor began in the same arm two months later. The case improved somewhat after treatment.

Traumatic Amyotrophic Lateral Sclerosis.—Hauck¹⁴ cites the case of a healthy laborer, who cut his left arm and right leg in 1881.

¹ Schmidt's Jahrbuch., No. 7, 1899.

² Berlin. klin. Woch., No. 7, 1899.

³ Aertzl. Sachverst. Zeitung, 14, 1899.

⁴ German Surgical Congress, 1899.

⁵ Tr. Clin. Soc., vol. xxx.

⁶ Monats. f. Unfallheilk., No. 6, 1899.

⁷ Monats. f. Unfallheilk., 1899.

⁸ Aertzl. Sachverst. Zeitung, May, 1899.

⁹ Amtl. Nachr., June, 1899.

¹⁰ Enke., Stuttgart, p. 564, 1898.

¹¹ Beiträge klin. Chir., Band 23, Heft 1.

¹² Med. Rec., Mar. 14, 1899.

¹³ Wien. klin. Woch., Jan. 12, 1899.

¹⁴ Aertzl. Praxis, 13, 1899.

Since then there has gradually developed a muscular atrophy of the left hand and right leg.

Multiple Sclerosis from Trauma.—B. Leick¹ relates the case of a laborer, aged 34, who received a violent blow from a plank upon the forehead, followed immediately by loss of consciousness, bleeding from the mouth and nose, and paralysis of the left side. Four months afterward there were headache, loss of sexual vigor, and pains and paresthesia in the feet. Speech was thick. Tremor was not well marked. No improvement followed treatment.

Spinal Concussion.—Stolper² finds that in his experience the so-called cases have been either cases with symptoms of contusion and laceration of the cord or vertebral column, or cases in which psychosis could be invoked as an explanation of the severity of the subjective symptoms in the absence of objective ones.

H. Schmaus³ outlines the present state of knowledge concerning **spinal commotion**. He considers that the proof of a pure spinal commotion has not yet been given, as no case recorded has been free from lesions of the vertebral column. He considers that a line must be drawn between spinal and vertebral commotion, and that the previous cases are not sufficiently exact to exclude sources of error.

Leppmann,⁴ as a result of a **medical investigation of noise**, says that in order to produce serious consequences the noise must have lasted for a considerable period. Those most likely to be injurious to health are: noises during sleeping-hours; noises which are unequal, with alternating shrill or very deep tones, especially when intermittent, as the anticipation has a disturbing influence; noises associated with vibration of the floor or table or working implement. The absolute intensity of noise is the least important factor, as we have no scientific means of recording sound intensity.

G. Gottwald⁵ has written a monographic article on the relation of **caries of the ear** to legal medicine.

Rath⁶ reports on the connection between **head-injury and ear-disease**.

John Thompson⁷ detected simulated deafness by a phonendoscope being placed with the tubes in both of the patient's ears; then a tuning-fork was connected with it by touching its tympanum, and the tube from the patient's sound ear disconnected near the body of the instrument without his noticing it.

Treitel⁸ deals with the **estimation of ear-diseases after injury**. He holds that every case of head-injury should undergo expert examination of the ear as soon as the condition of the patient permits it. At that time simulation is more easily detected than later. Care must be used in syringing ears immediately after the injury; and cases of bleeding from the ear should be treated antiseptically. The disability would depend in each case upon the extent to which deafness, vertigo, etc., interfered with the occupation.

The diagnosis of **traumatic diseases of the internal ear** is

¹ Deutsch. med. Woch., Aug., 1899.

³ Münch. med. Woch., Mar. 3, 1899.

⁵ Viertelj. ger. Med., Suppl. I., 1899.

⁷ Laryngoscope, Jan., 1899.

² Aertzl. Sachverst. Zeitung, 15, 1899.

⁴ Aertzl. Sachverst. Zeitung, 2, 1899.

⁶ Diss., Strassburg, 1899.

⁸ Monats. f. Unfallheilk., p. 320, 1899.

dealt with by R. Müller.¹ He refers to 35 medicolegal cases with typical symptoms—loss of hearing, headache, giddiness, and tinnitus, and secondary symptoms of nervous disturbance, paresis, and sleeplessness, and nystagmus. The relation between intensity of deafness and severity of subjective symptoms is a constant one. [This does not hold good of all stages, as deafness increases as other symptoms diminish, as a rule.] High notes of the tuning-fork are better heard than low ones. Hyperemia of the tympanum is often seen after head-injury.

Maschka² has written an important treatise upon **ophthalmic accident practice**. Praun³ has also written an exhaustive monograph upon **injuries of the eye**.

Simulation of Surgical Diseases.—Joseph Levai⁴ says that the temperature should be proved normal before deciding that simulation is being practised. The commonest malady feigned is lumbago. Many patients know that in genuine cases the man can bend without pain, but not become erect. Persons with lumbago can raise their outstretched arms to 45° in a sagittal direction against resistance painlessly, but not above the horizontal. Pain is felt at once if the arms are moved backward in a sagittal direction. The arms stretched in a frontal direction can be moved painlessly forward and downward, but not backward and downward if resistance is sufficiently strong. When the patient sits on a chair he can raise the lower extremities against resistance but not lower them (and extend the hip). This is a specially good test. In testing the muscles, first put the suspected group in action, then out of action, making direct resistance from a point sufficiently removed from the seats of complaint.

MEDICOLEGAL TESTS.

Oscar Amedo⁵ has written a treatise on the **medicolegal aspects of dentistry**, especially with regard to its service in aiding identification.

Maurice Leprince⁶ gives a careful study of **spermatozoa formation** in relation to legal medicine.

H. Gross⁷ points out that as blood-stains are often removed from clothes by oxalic acid, and from woodwork with dilute sulphuric acid followed by soda, the recognition of these substances under such conditions is almost as conclusive as actually finding the original blood-stains.

According to H. Gross,⁸ **tattoo-marks** can be removed without the painful processes of excision or obliteration, which leave deep scars, by using a paste of salicylic acid in glycerin, applied by a compress and kept in position by a bandage. Even this leaves a shiny-red appearance of the skin for about 2 or 3 years. If the affected area corresponds in size or position with the record of the tattooing, it gives circumstantial evidence that a mark of identification has been removed.

Daubler,⁹ in attempting to distinguish human from animal blood by measurement of the blood-corpuscles, found that the **dimensions of**

¹ Charité Annalen, xxiii.

³ Ibid.

⁵ Jour. de méd. de Paris, Jan. 1, 1899.

⁷ Arch. krim. Anthrop., Band 2, Heft 2.

² Bergmann, Berlin, 1899.

⁴ Wien. klin. Rundschau, 25, 1899.

⁶ Paris Thesis, 1899.

⁸ Ibid., Jan. 19, 1899.

⁹ Viertelj. ger. Med., Oct., 1899.

the red blood-disks could be retained by a mixture of 1 part of formalin in 3 parts of serum in glycerin. The preparation becomes transparent without swelling of the corpuscles.

Formalin as a Reagent in Examining Blood-stains.—G. Puppe¹ finds that in combination with an alkali and Pacini's or Rousini's solutions this substance has the property of preserving the form of the blood-corpuscles for microscopical examination, while the coloring-matter may be extracted for chemic and spectroscopic tests. The altered blood-pigment is soluble in alcohol. [The test promises to be of much value, as the methods in use have not permitted this.]

C. Ipsen² recommends for the **chemic detection of carbon monoxid** in blood agitation in a tightly closed test-tube to which a few drops of caustic alkali solution and a little pure glucose have been added; monoxid blood becomes cherry-red and normal blood blackish red. He claims that 8% to 10% of monoxid is sufficient to produce the reaction. A control-tube with normal blood should be used.

L. Wacholz³ finds that the grape-sugar test recently recommended by Ipsen is inferior to the tannin-test in delicacy.

Infectious Diseases and Legal Medicine.—V. Babes⁴ concludes as follows: The bodies of healthy persons dying suddenly are free from bacteria if examined before putrefaction sets in. Hence the presence of bacteria (*Bacterium coli*, *Bacillus proteus*) in a perfectly preserved fresh body indicates terminal infection. Hemorrhagic septicemia is very liable to be mistaken for ecchymoses. A short account is given of 6 cases of anthrax, with a cerebral lesion, so rapidly fatal as to simulate apoplexy or poisoning. In certain cases bacteriologic lesions may show a natural cause of death even in greatly decomposed bodies.

Radiography in Legal Medicine.—A case is cited⁵ in which a workman, wounded by a revolver-shot in the orbit, became gradually blind. It was claimed by the defence that the blindness had no connection with the injury; but the radioscope showed that the optic nerve was in the track of the ball. In another case a coachman tried to kill his mistress, firing at her head and then shooting himself in the chest. The balls were extracted and the wounds healed. At the trial it was claimed that the revolver had gone off accidentally, only one ball having been extracted; but this plea was abandoned when the radioscope showed a second ball lodged below the site of the first, at the back of the head.

TOXICOLOGY.

A. J. Kunkel⁶ contributes a monograph, of which only the first part, consisting of 564 pages, has appeared.

In a new work on toxicology, only advance sheets of which have as yet appeared, Vibert⁷ aims at treating the subject from the standpoint of the medical expert as distinguished from the purely toxicologic chemist. The sifting of the data available by such a man as Vibert should be of great service.

¹ Viertelj. ger. Med., Apr., 1899.

² Ibid., Oct., 1899.

³ Ibid., June, 1899, p. 566.

⁴ Ibid., July, 1899.

⁵ Ann. d'Hyg. pub., Mar., 1899.

⁶ Lehrbuch der Toxicologie, Jena, 1899.

⁷ Paris, Baillière.

In addition to the usual information given in works of this class, the discussion of physiologic experimenting with poison is very fully treated of by J. Ogier.¹ The book is well up to date.

Beskreda² has made a microscopic study of immunity against arsenical compounds, especially as to the role of the leukocytes. Chemotactic experiments with arsenic showed the intensity of leukocytic reaction to be proportionate to the resistance of the animal. It varies with the animal employed, the dose of the poison, and whether the animals are habituated to arsenic or not. In massive toxic doses a hypoleukocytosis occurs, the number falling proportionately with increase of the dose. The fall is in the number of polynuclear cells, their relative number being $\frac{1}{4}$ to $\frac{1}{5}$ the normal ratio to mononuclear, the majority of white cells remaining are small lymphocytes. If the animal recovers completely, the hypoleukocytosis is succeeded by a hyperleukocytosis, chiefly of the polynuclear elements. If the animal survives several days, there occurs first a hypoleukocytosis, followed by a transient hyperleukocytosis, and then again a hypoleukocytosis. The leukocytes are found to contain arsenic in this stage when they are in excess, but not in the final hyperleukocytic stage.

Bacteriologic Evidence in the Medicolegal Diagnosis of Poisoning by Arsenic.—E. di Mattei³ considers that the Gosio test for arsenic is superior in delicacy and rapidity to the Marsh test, and can be applied to the examination of organs.

F. Harbitz⁴ reports an instance of **food-poisoning**, after eating putrefied fish, in a family of 5 that ate putrid red herring. Within 5 days all became ill with nausea, constipation, and diplopia, lasting 6 weeks to 2 months, followed by paresis of the eye-muscles and paralysis of the pharynx and bladder. In 1 case symptoms persisted for 7 months.

Several outbreaks due to **meat-poisoning** were studied by Herbert Durham,⁵ who traced it to the effects of the *Bacillus enteritidis* Gärtner and the butyric bacillus of Van Ermengen. Out of 4 outbreaks, the serum-diagnosis method indicated in 3 the bacillus of Gärtner, and in the other the bacterium was isolated. The cow supplying the meat was found to be diseased. The symptoms were rigor, brief fever, great weakness, thirst, onset sudden, with vomiting, and pains in the joints.

Karn⁶ reports that in 3 cases of poisoning from **spoiled ham** the symptoms first appeared 2 days after the meal, and were chiefly paresis of the ocular muscles, dryness of the mouth, gastric uneasiness, constipation, and hoarseness. Stomatitis followed. The symptoms lasted 1 month. [The condition more resembles infection.]

S. Kob⁷ reports a case in which morphin-poisoning of a newborn child by its mother was detected by the presence of bismuth in the greatly decomposed body. On the assumption that bismuth was usually given with opium, it was found that the mother had shortly before procured powders of bismuth and opium. A verdict of manslaughter was rendered.

L. Hougonneug⁸ reports a case of criminal **poisoning by lead**, in which small doses were continued during a period of 6 months. The

¹ *Traité de Chemie toxicologique*, O. Doin, Paris, 1899.

² *Ann. de l'Inst. Pasteur*, No. 3, 1899.

⁴ *Deutsch. med. Woch.*, Feb. 23, 1899.

⁶ *Aertzl. Praxis*, No. 4, 1899.

³ *Rivista Med. Leg.*, Feb., 1899.

⁵ *Brit. Med. Jour.*, Dec. 17, 1898.

⁷ *Viertelj. ger. Med.*, Apr., 1899.

⁸ *Arch. Anthropol. Crim.*, May, 1899.

symptoms were vomiting, colic, and constipation, followed by paresis and epileptiform seizures. The suspected persons were convicted.

Bullinger¹ mentions among **drugs in which oxalate crystals** occur, squills, condurango, *Uva Ursi*, rhubarb, jalap, and ipecacuanha. This is a point to be remembered when crystals are found in the stomach.

Neumann² reports that small ulcerations, having the character analogous to **iodid-eruption** on the skin, were found in the stomach of a woman who had died of nephritis, and had been taking potassium iodid, and who presented the atypical cutaneous eruption.

Neuburger³ contributes an article upon **sublimate-poisoning**. A good literary review of the whole subject is given, including 200 references.

F. Strassmann⁴ states that the **passage of sublimate through the placental circulation** shows that in poisoning by large doses the sublimate is found in the fetus; but in repeated small doses this is not the case. He explains this by the fact that the placental lesion occurs in several cases, which favor the transmission.

Asphyxia from Hydrogen Sulfid in Sewer-gas.—L. Surre⁵ reports the case of 6 workers in sewers, who were overcome by the gases. Five were resuscitated. In the fatal case the gas from the blood, received a few hours after death, blackened lead-acetate paper, and the urine also gave this reaction. No spectroscopic changes could be detected in the blood. No anatomic lesions were found at the autopsy.

R. Alberici⁶ has studied the **diffusion of alcohol in dead bodies**. Experiments on dogs show that after postmortem introduction of alcohol into the stomach, it is recoverable in the heart, lungs, liver, and spleen. In the muscles, kidneys, and brain it was only found when more than 12 hours had been allowed for its diffusion.

Wodke⁷ records injuries to health in safety-match factories from **potassium bichromate**. The lesions consist of ulcerations of the nasal septum, caused by the inhalation of irritating particles.

C. Richet⁸ found the **toxicity of thallium** (0.055 gm. per kg. of dog) to be about the same as lithium and other substances which resemble it chemically, though it follows the law that the rarer metals of a group are more toxic than the common ones.

G. Carrière⁹ writes upon the **influence of anthrax-infection on strychnin-poisoning**. The resistance to the poison was not altered during the first hours after infection, when it increased and subsequently diminished.

Nitronaphthalin vapor is mentioned as a cause of **opacity of the cornea** by V. Hauke.¹⁰ It comes on gradually, making objects look hazy. In the central zone of the cornea is a grayish, ill-defined opacity, due, on closer examination, to closely set vesicles.

P. Petit¹¹ calls attention to certain toxic accidents in connection with enamels dissolved in benzin. The trouble is due to the presence of carbon disulphid in crude benzin.

¹ Viertelj. ger. Med., July, 1899.

² Aertzl. Sachverst. Zeitung, Mar. 4, 1899.

³ Ann. d'Hyg. pub., Mar., 1899.

⁴ Viertelj. ger. Med., Oct., 1899.

⁵ Ibid., No. 3, 1899.

⁶ Wiener Med. gessellsch., Feb. 3, 1899.

⁷ Arch. f. Anat. phys., Suppl., 1899.

⁸ Rivista di Med. Leg., May, 1899.

⁹ Soc. de Biol., No. 12, 1899.

¹⁰ Wien. klin. Woch., No. 27, 1899.

¹¹ Jour. des Brasseurs; Ann. d'Hyg. pub., Mar., 1899.

Acute Psychosis from Salicylic Poisoning.—Saloschin¹ records a case in which an anemic girl of 31, suffering from acute rheumatism, was given 18 gm. of sodium salicylate in 36 hours, and became violently delirious with hallucinations and delusions, these disappearing completely in 18 hours. Associated with this were the dulness, headache, and tinnitus characteristic of the drug.

SEXUAL.

Neugebauer² has minutely studied the **injuries to the female sexual organs during coitus**. Records of 157 cases, divided into the following 30 groups, are given: 1. Severe hemorrhage with normal laceration of hymen. 2. Hymenovaginal rupture. 3. Laceration of the hymen, and extending to stretching of the rest of the vulva. 4. Perforation of the hymen, leaving normal orifice intact. 5. Stripping off of hymen at line of attachment to vulva. 6. Lesions of vulva with false passages in greater labia. 7. Laceration of hymen extending to urethra. 8. Laceration of clitoris or meatus. 9. Laceration of navicular fossa. 10. Laceration of frenum labiorum pudendi. 11. Laceration of perineum. 12. Laceration of sphincter ani. 13. Laceration from anal orifice to mons veneris. 14. Coincidence of several of above lacerations. 15. Longitudinal laceration of first vaginal wall. 16. Longitudinal laceration of anterior vaginal wall. 17. Of lateral wall. 18. Laceration of posterior vaginal fornix, superficial. 19. Laceration of posterior vaginal fornix extending down to the parametrium. 20. Laceration of the posterior vaginal fornix, parametrium, and peritonem. 21. Laceration of the vaginal fornix opening Douglas's culdesac, with prolapse of intestine. 22. Laceration of the vaginal fornix and prolapse of the cervix. 23. Lesions of the bladder with hemorrhage in cellulitis. 24. Vesicovaginal fistula. 25. Paravaginal false passage. 26. Rectovaginal fistula. 27. Laceration of perineum into rectum. 28. Vulval sinus from hymen. 29. Perforation of septum of duplex vagina. 30. Perforation of septum of a bifid hymen.

Persistence of Hymen after Marriage.—*L'Anjou méd.*, — 1899, reports 3 cases after 10, 15, and even 20 years respectively of married life. The first 2 were observed through examinations necessitated by intercurrent disease. In the other case the parties wished before adopting a child to know if the sterility of the woman was absolutely permanent.

A. Mantzavinds³ relates a case of **false accusation of rape**. The act said to have been committed the previous day by accused, a boy. No marks of violence were seen, although energetic struggle was alleged, but blood was seen on the chemise and drawers. The genitals were blood-stained, and the hymen recently ruptured and bleeding. Employment of an anesthetic or narcotic was excluded. On digital examination a broken hen's egg (!) was found in the vagina. The girl's parents subsequently admitted having forcibly introduced it in order to simulate the appearance of rape.

¹ Wien. klin. Rundschau, May, 1898.

² Monatsh. f. geburtsh., Band 9, Heft 3.

³ Indépendance médicale; Arch. d'Anthrop. crim., Mar., 1899.

F. Neugebauer¹ gives an analysis of 50 cases of **marriage between persons of the same sex**, with several cases of divorce from errors of sex.

Injury of Domestic Animals by Sexual Perverts.—A. Guillebeau² emphasizes the importance of veterinarians being familiar with the evidence of such acts. In cases of sadism valuable cattle were found to be destroyed. The unnatural sexual acts were, however, fatal only in the case of hens; these showed rupture of the liver and fatal bleeding, and sometimes broken bones. In 1 case human spermatozoa were found in the cloaca, which was unusually widened. Wounds of the vagina, with rectal and peritoneal perforation were met with in cattle subject to sadistic acts. In 1 case a cattle-tender was shown to have introduced a pitchfork handle into the vagina and twisted it round.

Case of Precipitate Labor in a Primipara of 43.—Knepper³ tells of a child that was born with only very short pains, taken for desire for defecation, into a chamber-pot. The escape of the liquor amnii was first noted afterward. The child was a girl, weighing 3000 gm., diameters of the head not given. About 4 months later a slight prolapse of the anterior vaginal wall was noted.

Exceptional Cause of Syncope during Accouchement.—P. de la Touche⁴ relates the case of a woman, weak and in poor health, who was confined alone. After feeling with her hand the head protruding from the vagina the labor did not advance. She then passed in a pair of scissors between the head and perineum, and divided the perineum. The pain caused her to faint. Subsequently, on coming to, the child lay between her legs. She tied a knot on the cord. On the arrival of the neighbors the child was found to be dead.

Self-inflicted Vaginal Injuries by a Fragment of Copper Sulphate.—Kuhn⁵ says that a girl of 23 had a discharge of slimy blue fluid from her vagina; the vaginal mucosa was eroded and discolored blue-gray; there was deep-seated corrosion of the posterior vaginal wall, with sloughing of the surface. She had placed a piece of blue vitriol, as large as a plum, in the vagina to relieve constipation. After separation of the sloughs the wound healed rapidly.

Coffin-birth.—A case is reported by Langerhans.⁶ The body, that of a girl of 16, dead of phthisis, was placed upon the autopsy-table 60 hours after death, in February, with no signs of decomposition. The attendant noticed a prolapse of the uterus, and on his return about 20 minutes later the head of the child was seen to be completely delivered. There were no signs of liquor amnii. Pregnancy had not been diagnosed. The development of the child indicated $7\frac{1}{2}$ months.

MENTAL.

G. Villeneuve and E. P. Chagnon⁷ report a number of cases in which lunatics were condemned by mistake by the courts. This subject has also been made the subject of a very full discussion by the French Congress of Alienists in 1899.

¹ Rev. de Gyn., Mar. and Apr., 1899.

² Schweizer Arch. f. Thierheilk., i., 1899.

³ Viertelj. ger. Med., Oct., 1899.

⁴ Ann. d'Hyg. pub., Apr., 1899.

⁵ Viertelj. ger. Med., July, 1899.

⁶ Ibid., Jan., 1899.

⁷ L'Union méd. du Canada, June, 1899.

PUBLIC HYGIENE AND PREVENTIVE MEDICINE.

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OF BOSTON, MASS.

MANAGEMENT AND CONTROL OF INFECTIOUS DISEASES.

Bacteriologic Diagnosis.—J. W. Washbourn¹ discusses "Bacteriologic and Clinical Diagnosis in Relation to some of the Notifiable Infectious Diseases," selecting diphtheria, scarlet fever, and typhoid fever as examples. In discussing the questions "How far can we trust a positive result?" and "Can we absolutely rely upon a report stating that bacilli are present?" he says: "Upon the strictly scientific point of view we cannot, as it is impossible to distinguish the true *diphtheria*-bacillus from other allied microorganisms by the method of examination adopted; for example, the *xerosis* bacillus. We must therefore admit that the ordinary method of bacteriologic examination of the throat will not enable us to say for certain that we are dealing with diphtheria-bacilli. Another difficulty consists in the fact that true diphtheria-bacilli are found at times in the throat and nose without giving rise to local or constitutional disturbance. Are persons thus affected capable of conveying the disease to others? As the result of considerable experience I believe that bacilli resembling the diphtheria-bacillus in morphology are seldom found in inflamed throats except in cases of diphtheria. What course should be adopted when diphtheria-bacilli, or bacilli resembling the diphtheria-bacillus, are found in the healthy throat? Should the individual be isolated? We are not justified in subjecting the person to the hardship of isolation unless the bacillus has been proved by all the necessary tests to be a true diphtheria-bacillus. I personally believe that all persons with true diphtheria-bacilli in the throat or nose may convey infection, but I think that with care the risk of infection is not very great. We now examine systematically the throats of all the scarlet-fever patients at the London Fever Hospital, and isolate as far as possible those with bacilli resembling the diphtheria-bacillus in their throats. Since this has been adopted we have had no outbreak of postscarlatinal diphtheria." In the case of *scarlet fever*, dependence must be placed upon the clinical diagnosis. The diseases liable to be mistaken for it, in addition to diphtheria are measles, German measles, erythemas and drug-rashes, septic eruptions, and the initial rashes of variola and other fevers. The difficulty in the diagnosis of this disease will never be overcome till we possess some new method of examination, such as bacteriology may possibly supply. In the case of *typhoid fever* the important diagnostic symptoms are pyrexia,

¹ Jour. Sanitary Institute, vol. xx., part 1, p. 43, 1899.

rash, diarrhea, tumefaction of the abdomen, bronchitis, and enlargement of the spleen. The rash is the most pathognomonic symptom. Each case must be judged upon its merits, all symptoms being taken into account. Much may be done by eliminating other diseases; pneumonia and phthisis by careful examination of the lungs, and malaria by examination of the blood. The author also testifies to the great value of the serum-test; if the reaction is absent during the whole course of the disease, typhoid can almost certainly be excluded.

Cost of Bacteriologic Examination for Diagnosis.—D. G. Davies¹ presents a list of the London and Provincial districts to the number of 33 which afford opportunities for bacteriologic diagnosis for diphtheria, tuberculosis, and typhoid fever at a cost ranging from 2s. 6d. to 5 s. (60 cts. to \$1.25) for each examination. In some of these districts antitoxin is supplied at cost price.

Influence of Elementary Schools in Spreading Scarlet Fever.—Niven,² Medical Officer of Health of Manchester, observes a decided drop in the prevalence of the disease in the summer holidays. His observations confirm those of Murphy of London.³ Niven thinks the extreme measure of closing a school for scarlet fever is rarely called for, and is not so likely to be effectual as in the case of measles.

Diphtheria in Germany.—The Imperial Board of Health of Germany publishes two maps, colored to show the mortality from diphtheria in the periods 1885–1894 and 1895–1897, these periods representing the mortality before and after the introduction of antitoxin in the treatment of diphtheria. The supply has been unlimited since 1894, and its employment universal both in hospital and in private practice, its use being deemed morally if not legally imperative, with the result that the death-rate has fallen from an average of 15.5 per 10,000 for the whole country to 9.9 in 1895, 7.6 in 1896, and 6.2 in 1897.

Typhus Fever.—Littlejohn of Edinburgh⁴ reports an epidemic of typhus. The disease was imported in August, 1898, and was spread by means of a "wake." He advises treatment of the disease only in an infectious-disease hospital. Only those in intimate contact with the sick appear to become infected. The disease is now so rare that young medical men do not recognize it, and hence it may spread rapidly at first. Out of 79 cases there were 9 deaths.

Diphtheria and School Attendance.—Shirley Murphy's⁵ recent report gives prominence to the view that the prevalence of diphtheria is increased by school attendance. The experience of nearly every medical officer of health will furnish instances of this, and Murphy's exhaustive and careful analysis of the metropolitan statistics furnishes statistical support to what has come within the experience of nearly all. The demonstration of the relation between school holidays and a fall in the amount of diphtheria is particularly striking, though it appears to a very unequal extent in different years. In this report Murphy has not only brought this aspect of the question up to date, but has supplied some very interesting additional figures as to the altered age-incidence of fatal diph-

¹ Public Health, June, 1899, p. 602.

² Ibid., Sept., 1899, p. 787.

³ Report of London County Council, 1897.

⁴ Public Health, Sept., 1899.

⁵ Diphtheria and Elementary Schools. Report by the Medical Officer of the London County Council, 1898, p. 36; also Public Health, Feb., 1899, p. 305.

theria plus croup. There has been a noteworthy increase in the relative incidence of diphtheria mortality between the ages of 3 and 15 years which did not appear before the period 1871-1880.

Effect of the Use of Antitoxin upon the Death-rate from Diphtheria.—The evidence upon this point presented during the past year is chiefly cumulative, and is overwhelmingly in favor of the use of antitoxin as a therapeutic and as a prophylactic measure. The evidence is furnished mainly from its hospital use, but the figures presented by the Board of Health of Massachusetts are those of cases which occurred both in private practice and in hospitals, but chiefly of the former class. The general mortality from diphtheria and croup in the State for the 4 years 1891-1894, prior to the introduction of antitoxin into general practice, was 28.3% of the reported cases during that time, but that of the 4 following years, 1895-1898, was only 15%, while that of the persons reported as having been treated with antitoxin during 3 years was only 10.7%.¹ Murphy, in his report upon the health of the city of London,² quotes similar figures; so also does the Imperial Board of Health of Germany.³ On the other hand, Kassowitz of Trieste inveighs against antitoxin in the strongest terms,⁴ saying that the results of the use of antitoxin in Trieste furnish "a bloody illustration of Behring's claims with reference to the safe operation of antitoxin." It is interesting to know how an intelligent layman views the subject from a purely statistic standpoint. With this object in view, the greatest living statistician, Körösi of Budapesth⁵ (who so very clearly demonstrated the value of vaccination from the statistic standpoint at the International Congress at Washington in 1887), critically reviews the statements of Kassowitz, and shows their illogical character, since the value of the remedy is shown, not by the lessening in the crude mortality (the death-rate of a given population from a given disease), but by the decrease in the lethality, or ratio of deaths to existing cases; and this had happened in Trieste as well as elsewhere.

The Campaign against Tuberculosis.—The Fourth Congress for the Study of Tuberculosis at Paris⁶ passed the following votes: 1. As soon as the notification of tuberculosis has become obligatory in all places, sanitary cuspidors should be placed and placards posted stating that spitting must be allowed only into the cuspidors. 2. The Government should see that this rule is enforced in all public buildings, and especially in schools. 3. Tuberculous persons must not be taken to establishments for convalescence intended for persons sick with other diseases. 4. Special establishments for the cure of children should be erected. 5. A committee of physicians should be appointed to have charge of the establishment of free sanatoria. 6. Medical men should urge the establishment of as many small establishments for treatment of phthisis as possible. 7. The educational and sanitary authorities should, by their official patronage, encourage the extension of the work already begun by the League against Tuberculosis in Paris, into other cities of France. 8. A committee of the French Exposition of 1900 is to have general charge

¹ Report of Mass. State Board of Health, 1899. ² P. 39.

³ Arbeiten a. d. Kais. Gesundheitsamte, 13, p. 254, 1897.

⁴ Der Kinderarzt, 1898, ix., p. 197; also Berlin. klin. Woch., 37, 1898.

⁵ Therap. Monatsh., Sept., 1898.

⁶ Presse méd., No. 64, 1898.

of the question of giving information to visitors as to the best methods of avoiding infection from tuberculosis. 9. International organizations should make the subject of tuberculosis a subject of study, chiefly with the view of its prevention. 10. The government should adopt measures to prevent the fraudulent use of tuberculin, when employed to avoid the recognition of the disease. 11. The following measures were recommended relative to tuberculosis in cattle: (a) The separation of all diseased animals from the healthy. (b) No sick animals should be sold except for slaughter. (c) All dairies which produce milk for public consumption must be subject to inspection, and every cow suffering with tubercular disease of the udder is to be killed at once. (d) Milk intended for the manufacture of butter and cheese to be sterilized or pasteurized. (e) Inspection of meat in the slaughter-houses to be carried out in the same manner as has been done in Belgium.¹

Compulsory Notification of Phthisis.—Byrom Bramwell² discusses very fully the propriety of compulsory notification of phthisis. The question resolves itself into the following inquiry: "Will the compulsory notification of phthisis materially aid us in the prevention of phthisis and other forms of tuberculous disease; and, if it will materially aid us toward this end (and in my opinion there is no doubt whatever that it will do so), are the disadvantages which would result from, and the objections to, a system of compulsory notification, specially adapted to the peculiarities of phthisis, sufficiently great and sufficiently well-founded to overbalance the advantages and to negative its adoption?" The advocates of the plan have therefore to show: 1. That compulsory notification would be beneficial. 2. That it is possible to formulate a system of compulsory notification which would be both effective and which would work well in practice. 3. That the objections which can be urged against such a system of compulsory notification are less important than the advantages which would result from it. The author favors such notification. In the same journal, July, 1899, the question is further discussed *pro* and *con* by many noted English authorities, the weight of argument being in favor. The New York system is pointed out as a model. Newsholme of Brighton, England, advocates a modified system, in which voluntary notification is to be encouraged, and that power be given to local authorities to adopt the compulsory plan as soon as "public opinion is sufficiently ripe for this purpose."

Abolition of Tuberculosis in Cattle.—Meredith Young³ clearly defines from a public health and practical standpoint what measures should be taken to eradicate tuberculosis from cattle. The first step is the appointment of a staff of veterinary inspectors, and the application of the tuberculin-test to all dairy animals. The next thing is to decide what must be done with reacting animals. The inspector should make a clinical examination of any reacting beast, and particularly of the udder. Young divides those which react into three classes: 1. If the udder is affected and the animal is in an advanced stage of disease it should be slaughtered and no compensation given. 2. If the animal is affected slightly and the udder diseased (a combination seldom found) the animal

¹ See also the "Present Condition of Bovine Tuberculosis in Europe," by Prof. Conn, in Bulletin No. 19, of Experiment Station of Connecticut, Feb., 1899.

² Med. Mag., June, 1899, p. 515.

³ Public Health, June, 1899, p. 612.

should be prohibited from use in connection with the milk-supply, but should be isolated, fattened, and slaughtered. Compensation should be paid to cover the actual loss sustained by the farmer—*i. e.*, the difference between the value of the cow as meat and her value as a milker. 3. If the animal is slightly affected, the udder healthy, and the milk proves to be harmless, nothing need be done but to keep a careful lookout upon the animal. As soon as the udder becomes affected the animal should be removed from the milk-supply, and the measures indicated under (2) carried out. Further measures needed to demonstrate the harmfulness of the milk of tuberculous animals (experimentally) should be undertaken at the public expense.

The following ordinance has been enacted for the protection of consumers of milk and meat in New York City :

That no diseased or sickly cattle, swine, or sheep, nor any horse, dog, or cat, which is suffering from, or has been exposed to, any disease which is contagious among animals, shall be brought into the city of New York. All persons, corporations, or companies bringing milch cows into the city of New York shall furnish a certificate signed by a veterinarian who is a graduate of a recognized veterinary college, with the date of graduation and the name of the college from which the degree was received, to the effect that said cows are free from tuberculosis as far as may be determined by physical examination and the tuberculin-test. Said certificate shall give a number which has been permanently attached to each cow, and a description sufficiently accurate for identification, stating the date (which must be not more than 60 days prior to the time they are brought into the city), the place of examination, the temperature of the cow or cows at intervals of 3 hours for 12 hours before the subcutaneous injection of the tuberculin, the preparation of tuberculin used, the location of the injection, the quantity injected, the temperature at the tenth hour after the injection of the tuberculin, and every 3 hours after the aforesaid tenth hour for 12 hours, or until the reaction is completed. No cow with a certificate which states that said cow gave a reaction of 2° F. after the injection with 0.5 cc. of the tuberculin prepared by the Department of Health of the city of New York (or its equivalent), diluted with 10 times its volume of a 0.5% watery solution of carbolic acid, shall be brought into the city of New York.

Public Abattoirs Useful in Facilitating the Reduction of Tuberculosis.—W. A. Bond,¹ Health Officer of Holborn (London), advocates the establishment of public abattoirs as an advantage to the stockman, the butcher, and to the consumer, because the increased facilities for inspection thus afforded would cause the stockman to eliminate disease from his stock, and thus diminish his losses. The consumer would also receive a meat-supply wholesome and free from disease. He advises 6 public abattoirs for London.

Tuberculosis in Ireland.—Letters² shows that while tuberculosis has diminished in England from 3483 per million in 1851-60 to 2122 in 1891-95, in Ireland it has increased from 2546 per million in 1871 to 2851 in 1897. [The author does not take sufficient account of the age-distribution of the population of Ireland, which undoubtedly has an unfavorable effect.]

¹ Med. Mag., May, 1899, p. 393.

² Ibid., May, 1899, p. 401.

The Spread of Dysentery.—Richter¹ concludes that too much importance is attached to water-infection, and believes that, except in the case of sudden epidemics in densely settled towns, it would be advisable to consider more direct methods of infection in dysentery, cholera, and typhoid fever. He regards it unnecessary to declare each well as suspicious in every case of these diseases. According to his view, the infection travels more directly from man to man by direct bodily contact, or by exposure to the excreta of the sick.

Disinfection for Attendants on Puerperal Women Septically Infected.²—The following questions put to Professor Delepine are of general interest: 1. "What is the best way of disinfecting septicly contaminated hands?" 2. "Is a period of abstinence from midwifery practice advisable after contact with a puerperal septicemic case?" He replied: 1. Chlorinated lime solution (1 : 100) is best for the hands. The nail-brush and an alkaline soap should first be used, together with vigorous rubbing and washing of the hands, wrists, and lower part of the arms. 2. Absolute disinfection of the hands and clothing, and a good bath, including washing of the hair and beard, should be more effective than a period of abstinence from midwifery practice.

Disinfection of the Hands in Midwifery Practice.—Ahlfeld³ recommends hot water and alcohol for disinfection of the hands in obstetric practice, and opposes other methods, especially the use of lysol. Carbolic acid, cresol, and corrosive sublimate are inferior to alcohol and hot water. Carbolic acid, cresol, and sublimate, if used in sterilizing the hands, must be used in a solution too concentrated to be borne. Sublimate has inferior value for this purpose, since it does not penetrate the skin. If used with alcohol, the latter is the more effective, and hence the sublimate may be abandoned. Alcohol penetrates the outer skin and acts more thoroughly.

Smallpox and Vaccination in the Italian Army.—Rudolf Livi⁴ comments as follows upon the observations made from the statistics of mortality and disease in the Italian army: 1. Smallpox attacks the nonvaccinated in much greater proportion than the vaccinated. 2. When smallpox exceptionally attacks the vaccinated the danger is small. We are therefore unable to understand by what opinions and proof a serious and truly scientific opposition to protective vaccination can be maintained.

Diphtheria-bacilli in the mouths of healthy persons who have been associated with the sick have been found in 18.8% of the cases examined.⁵ "I have, by means of exact methods of differentiation in 123 cases examined, been able to prove the presence of diphtheria-bacilli in only 10 cases. We learn that they have been found in 7% of cases examined of persons who had no association with those who were sick with diphtheria. In 600 cases I found the bacilli in 15, or only 2½%. Among these 15 were 10 in which a positive connection with the sick could be shown. Hence the appearance of diphtheria-bacilli in the mouth of men having no connection with sick persons amounted to only 0.8 of 1%. All of the 15 cultures of these first experiments proved to be pathogenic; but in the 15 second cultures 10 were negative."

¹ Zeit. f. Med. beamte, No. 10, 1898.

² Public Health, May, 1899, p. 538.

³ Zeit. f. Med. beamte, 17, 1898, p. 531.

⁴ Hyg. klin. Rundschau, June 15, 1899, p. 593.

⁵ Zeit. f. Hyg., 31, p. 463.

Mosquitos and Malaria.—Ross,¹ in India, found that mosquitos which had stung birds, in whose blood the malarial parasite was found, and were then fed to other healthy birds, communicated the disease to the latter. Nuttall continues his papers upon insects as transmitters of infection.² The Italian Society for the Study of Malaria quotes an experiment in which a man was selected from a nonmalarial district and subjected to the bites of mosquitos from a malarious district, with the result of infecting him.³

The Recrudescence of the Plague.—W. J. Simpson,⁴ at the Congress of the Sanitary Institute at Southampton, said that the sudden disappearance of the plague from Europe was not to be accounted for by the commonly received view that it was due to advancing civilization, and its absence is no absolute proof of the immunity of any locality from it. The danger of its extension is increased by our present ignorance of the medium and agents by which the plague-bacillus gains access to the human body, and by the fact that although the disease is one which only slowly gains a firm footing in a locality, it is very difficult to dislodge it when once it gains a foothold. The author believes in inoculation with Haffkine's prophylactic as a protection against it, and also believes that the disease is spread by rats, and that these animals should therefore be dealt with at infected ports, on the voyage, and on arrival at healthy ports. In this he agrees with Koch, who has recorded his opinion that "the plague must be regarded primarily as a rat-disease, and only secondarily as a human one." He believes that with proper organization it is possible to deal with the plague as with an outbreak of smallpox, provided that ample supplies of Haffkine's prophylactic have been made ready beforehand.

Notification and School-closure in Relation to the Prevention of the Spread of Measles and Whooping Cough.—Henry Armstrong⁵ makes the following observations: In the 2 years ended Aug. 26, 1898, 7680 cases of measles and 3746 of whooping cough were notified by medical practitioners in that city, under the Infectious Disease Notification Act. Each case reported to the health department was visited. Printed instructions as to the most suitable means to be taken to prevent the spread of infection were left at each house. Disinfection of rooms, bedding, and clothing was practised in the same way as for other notifiable diseases. Special means were also taken to prevent the prevalence of these diseases in the schools, and particularly in infant schools. In Dec., 1896, request was made to the authorities that all schools (day and Sunday) should be closed for 4 weeks; this advice was acted upon without exception, and many schools were disinfected. In the following year (1897) the experiment was tried of closing each school, where scholars were being taken ill, for a few hours only, long enough to allow of thorough purification and the **sprinkling of the floors of class-rooms with disinfectants.** This disinfection, so

¹ *Lancet*, p. 3912, 1898.

² *Hyg. Rundschau*, vol. ix., pp. 80, 117, 209, 275, 393, 503, 606, 1899.

³ *Centralbl. f. allg. Gesund.*, p. 420, 1899.

⁴ *Local Govt. Chronicle*, p. 830, Sept. 9, 1899.

⁵ *Annual Report of the Medical Officer of Health of Newcastle-upon-Tyne for 1898, Newcastle-upon-Tyne, 1899.*

far as measles was concerned, was followed by extinction of the disease in the schools in question. In 1 school yielding 44 cases in 3 weeks preceding disinfection, after the first fortnight the number fell to a total of 3 in 13 weeks. Similar experience followed in other schools. The rule in the case of elementary schools was to wait until the infected households from which a school received scholars reached 10% of the scholars in the infant department before resorting to closure. In regard to whooping cough, the difficulty of diagnosis in time for prevention, the prolonged duration of infectivity, and the hopelessness of isolation and disinfection, all render notification unsatisfactory.

Anthrax, Disinfection with Formaldehyd in Rarefied Air; Hair and Bristles.—The occasional though rare occurrence of cases of anthrax in certain American towns where foreign hides are tanned or curled hair is manufactured renders the following results, obtained under the direction of the Imperial Board of Health of Germany, of special value.¹ These experiments were made by Dunbar and Muschold, whose conclusions were as follows: The method of disinfection was the exposure of packets of hair and bristles, in the iron disinfecting cylinders of Geneste Herscher & Co., to formaldehyd vapor—the air having been rarefied by exhaustion—as has been recommended by the Chemical Society of the Rhone factories (Lyons): 1. The method of disinfection adopted by this society, notwithstanding an exposure of 11 hours, and the development of formaldehyd in a ratio of 30 gm. to 1 cubic meter, failed wholly to disinfect packages of horsehair of only 20 cm. (8 inches) in thickness, containing anthrax spores of definite resisting power, and is consequently of no use in the disinfection of bales of horsehair, and of horsehair piled in bulk. 2. This procedure was more effective with packages of Chinese bristles of about 5 cm. in thickness, laid about loosely in the unopened paper packages, and also with bundles of bristles of 10 cm. in thickness, when these objects were not deposited in the upper part of the chamber—a sign that the gas is unequally distributed. We may therefore infer from the failure of this method that the procedure adopted by the Chemical Society of the Rhone factories for disinfecting bristles in large quantities is not effective. 3. The faults of the procedure are due, not to the insufficient disinfecting power of the formaldehyd, but to the fact that in the use of a vacuum the penetrability of the formaldehyd is not increased to the proper degree, and that the formaldehyd distributes itself unequally, collecting in the lower part of the chamber.

The Disinfecting Power of Common Soaps.—From the time when Koch² demonstrated the disinfecting power of ordinary soap many other observers (Behring, Reithoffer, and Beyer) confirmed his observations.

Serapin³ has made, at the University of Padua, a further series of experiments to determine more exactly the conditions of its action. He found that different kinds of soap varied very much in their disinfecting power, the best being the white and hard soaps of Marseilles and the marbled (Castile) soap. In the absence of other methods of disinfection,

¹ Arbeit. a. d. Kaiserlich. Gesundheit., 15, p. 114, 1898.

² Mittheil. d. Kaiserlich. Gesundheit., p. 234, 1881.

³ Ann. d'Igiene sperimentale, 2, p. 199, 1898.

soap forms a valuable resource. The solution should be about 3% or 4%, and the temperature from 85° to 105° F. Clothing should be allowed to soak several hours before rubbing. The author concludes from experiment that the so-called disinfectant soaps are not superior to other soaps as disinfectants. The soap should be very pure and should contain as little water as possible. The figures presented demonstrate the very great variation in disinfecting power of the ordinary commercial soaps. He attributes the diverse conclusions of earlier observers to the bad quality of the commercial brands upon which they had experimented.

Further valuable papers on disinfection are those of Peerenboom, on the Disinfection of Closed Rooms with Formaldehyd, in *Hyg. Rundschau*, Aug. 15, 1898; Disinfection of Books, Report on Use of Formaldehyd, New York City Department of Health, 1898; also a valuable manual upon the general subject of disinfection, published by the Secretary of the Board of Health of Maine, 1898.

FOOD-INSPECTION.

Food-preservatives.—In the examination of 2300 samples of food in the city of Birmingham, England, Alfred Hill,¹ the health officer, found preservatives in 460, or 20%, the substances employed being boric acid, salicylic acid, or formaldehyd. Boric acid was found in butter, margarine, bacon, sausages, and other animal foods. In butter the quantity varied from 7 to 84 gr. per pound. He quotes a considerable array of authorities, including several experimenters, in opposition to the practice of using food preservatives, or at least in favor of limiting their use. Hill found boric acid in 5% of 1360 samples of milk, in quantities of 3 to 130 gr. per gallon. The first objection to the use of such preservatives is the fact that they exercise a retarding influence in the digestion of both animal and vegetable foods. The Society of Medical Officers of Health, after hearing Hill's paper, adopted the following resolutions: "That the society strongly disapproves of the practice of adding preservative chemicals to milk and other foods. That if preservatives are added to any food a full disclosure as to their nature and amounts should be made to the purchaser." On the other hand, Rideal and Foulerton, in the same journal, present a series of experiments upon animals and upon food-substances, with the following conclusions: "1. Boric acid (1 : 2000) and formaldehyd (1 : 50,000) are effective preservatives for milk for 24 hours. 2. These quantities have no appreciable effect upon digestion. 3. These quantities have no appreciable effect upon the digestibility of foods preserved by them. 4. Formaldehyd, in the proportion given above, so far as our investigations have extended, does not appear to have any injurious action upon animal tissues or on nutrition."

Apparatus for Cooking Meat which is Unsound.—Such an apparatus is described by Abel.²

The Use of Food-preservatives.—James Niven, Medical Officer of Health of Manchester, presented to the town council a report³ upon the use of food-preservatives, July, 1898, the general tone of which is

¹ Public Health, May, 1899, p. 527.

² Zeit. f. Hyg., xxx., p. 376, 1899.

³ Brit. Food Jour., Feb., 1899. See also Jour. Exper. Med., vol. iv. No. 1, p. 47; Bliss and Novy on the "Action of Formaldehyd."

opposed to their use. With reference to the extent of their use he says: Ernest L. Fleming, who has given special attention to the use of boric acid and borax in the preservation of foods, estimates the total annual amount of these materials at present used throughout the world for preserving food at 6000 tons, of which the United States will use 2000 tons. Considerable amounts are also used in England, Norway, Denmark, and France. The largest amounts are employed in curing meat, ham, and bacon.

Unwholesome Oysters.¹—A bill was introduced in the British Parliament in May, 1899, having for its object the following provisions: 1. To provide for the inspection of oyster-beds or layings, and analysis of the water of such places. 2. To prohibit the sale of oysters from unhealthy places, except after they have been deposited for 10 days in some other and approved place. 3. To prevent the importation of oysters from unhealthy places.

Tubercle-bacilli in Oleomargarine and Butter.—Morgenroth² says: "From the results of observations we may say that genuine tubercle-bacilli are found in margarine, and not unfrequently. Hence this food should be subjected to careful inspection before it is offered for sale." On the other hand, Rabinowitsch³ presents further observations showing the presence of tubercle-bacilli in market butter obtained in Berlin. Two samples of 15 collected contained living virulent bacilli.⁴ Obermüller⁵ found tubercle-bacilli in diseased specimens of German butter.⁶

Influence of Milk-supply in Spreading Tuberculosis.—Kanthack and Sladen.⁷

Experiments to Determine the Quantity of Zinc in American Dried Apples.⁸—The quantity of zinc in the dried apples varies much. The use of such food cannot have much injurious effect upon the consumer; but, in view of the uncertain amount of zinc which may be present, precaution is necessary, since stewed apples are often given to the sick and convalescing. Such metallic substances can be excluded from food without difficulty. The author quotes Lehmann's experiments, which show that the effect of zinc upon dogs is about the same as that of copper. The fear of danger which had been expressed may be disregarded, and from the investigations of Brandl it appears that if the zinc salts produce no injury to the mucous membrane of the stomach, large quantities cannot enter the circulation.

Adulteration of Food in Connecticut.—In the third annual report of the Connecticut Agricultural Station upon food-products,⁹ the director presents the results of his examination. Fruit jellies were found to consist of starch paste, sweetened with glucose, artificially flavored, colored (in all cases but one) with coal-tar dye, and preserved with salicylic acid. Saccharin prepared from coal-tar and costing \$15 per pound is now extensively advertised for use in food-preparations. It can be used in place of cane-sugar, and is 500 times as sweet. It has no nutritive properties. Adulteration of tea, with the exception of the so-called

¹ Public Health, July, 1899, p. 682. ² Hyg. Rundschau, May 15, 1899, p. 481.

³ Deutsch. med. Woch., No. 1, 1899.

⁴ See also Hyg. Rundschau, 8, 22, p. 1081, 1898.

⁵ Ibid., 2, ix., 1899.

⁶ See also Rev. d'Hygiène, pp. 78 and 575, 1898; Zeit. f. Hyg., 31, p. 137, 1899.

⁷ Lancet, Jan. 14, 1899, p. 74.

⁸ Arbeit. a. d. Kaiserlich. Gesundheit., 15, 2, p. 203. ⁹ Hartford, Conn., 1899.

"facing" of green tea, was found to be of very rare occurrence. Coffee is very often adulterated, and fac similes of labels found on fraudulent samples are published in this report. Out of 91 samples of ginger, 24 were adulterated, the adulterants being rice and wheat middlings, corn meal, turmeric, mustard, sawdust, gypsum, and chalk. Several samples of malt liquors contained salicylic acid. Honey contained cane-sugar and glucose syrup. Of spices, 41.5% were found adulterated. Of 25 different brands of wheat flour none were found adulterated.

Regulation of Ice-cream Manufacture.—An examination of the business of making ice-cream in Newcastle-upon-Tyne¹ revealed 24 places, 18 occupied by Italians and 6 by English. Many of the places were dirty, and the rooms used for manufacture were also the sleeping- and living-rooms. The mixture (flour, milk, sugar, and coloring-matter) was boiled to a paste over the living-room fire and frozen, the ingredients being stored in the dwelling-room. "Rinsings of the utensils contained microbes in abundance, some of them being identical with those found in the human intestine (*Bacillus coli*)."² The business was described as uncleanly, and in case of infectious disease in the family is liable to lead to widespread outbreak.

Sanitary Control of the Milk-supply in Copenhagen.—In an excellent paper before the Sanitary Institute of Great Britain,² James Niven quoted the principles which govern the Copenhagen Milk-supply Association, which are as follows: 1. The milk is brought from well-managed farms, where the strictest cleanliness is exacted in cowshed and cow. 2. The cows are frequently and regularly inspected by a staff of veterinary surgeons attached to the company. 3. Infectious disease is guarded against by a most liberal system of dealing with farmers and employees when infectious disease occurs in their families. 4. The taste and quality of the milk are ensured by prescribed and well-considered modes of feeding the cows. 5. Injurious changes in the milk are averted by a well-planned system of cooling the milk from the time it leaves the cow till it reaches the consumer. 6. Fraudulent tampering with the milk is guarded against by ingenious and effective precautions. 7. The utmost *régime* of cleanliness is exacted in all milk-vessels, dairies, etc., while the milk is carefully filtered clear of all impurities. The final article is thus rich, fragrant, clean, and free from danger. An equally successful company on the same lines exists at Berlin, and a similar company is being inaugurated in Manchester. The following resolution was also proposed by Niven: "That all public institutions, hospitals, asylums, and public services ought to obtain milk from herds guaranteed free from tuberculosis by a competent veterinary surgeon."

WATER-SUPPLY AND SEWERAGE.

Filtration of Surface-water in German Cities.³—After the last cholera-epidemic in Germany the government insisted upon the importance of filtering the water of such supplies as were drawn from the

¹ Armstrong's report on the health of Newcastle, 1899; also quoting Ham's report on the health of Islington.

² Journal of Sanitary Institute, Jan., 1899, p. 550.

³ Pannwitz, in Arbeit. a. d. Kaiserlich. Gesundheit., 14, p. 153, 1893.

surface. Koch and Piefke laid down certain rules which were generally accepted by experts. They stated that filtration should be conducted within definite rates of speed, and proposed the limit of 100 cubic decimeters per square meter per hour. Special attention should be given to the cleansing of the sand. Its depth should never be less than 30 cm. The first effluent of a recently cleansed basin should be rejected, and not used for drinking. Great importance is attached to the bacteriologic examinations, which should be conducted daily for each filter. When the water of a filter contains more than 100 bacteria per cubic centimeter it should be rejected as drinking-water. The author publishes a statement descriptive of the filtration plant of each of the 26 principal cities in Germany which take their supplies from streams and lakes, including the large cities of Berlin and Hamburg. All of the essential details are presented for each establishment, very much after the plan pursued by the Massachusetts State Board of Health in its special document of 1890 upon the "Examination of Water-supplies." These give the date of construction and additions, the daily consumption, the sources, the number of filter-basins covered or uncovered, their area—depth of sand, its character, methods of washing and cleansing it, with many other important items. In the last part of the report a statement of the progress made in the three years 1894–1896 is presented, especially in the line of reduction of the rapidity of filtration. A series of diagrams and tables is also presented, wherein the results obtained in the different establishments may be compared.

The Normal Chlorin of the Waters of Jamaica.—Richards and Hopkins¹ examined the natural waters of the island of Jamaica, and confirmed very conclusively the researches of the State Board of Health of Massachusetts in its examinations of the natural waters of Massachusetts, to the effect that the ratio of chlorin in the unpolluted waters of the State diminishes with remarkable uniformity from the seacoast inward, and this ratio of chlorin forms a valuable index or standard of comparison for any given region. The authors present a table, and a map of the island of Jamaica with isochlorin lines, ranging from a maximum at the seacoast to 0.30 per 100,000 parts as a minimum in the inland regions of the island.

The Purification and Sterilization of Drinking-water.—Since 1897 Henri Berge,² in conjunction with Albert Berge and Emile Stein, has made important experiments with a little-known gas, viz., binoxid of chlorin, which has proved to have remarkable powers in sterilizing water. Its formula is ClO_2 , and its preparation is very simple, consisting in decomposing chlorate of potassium by sulphuric acid (64° Beaumé) at an ordinary temperature, the reaction, by the author's method, presenting no danger. The gas is soluble in water, and decomposable by light, heat, or by contact with organic matter, upon which its effects are very rapid. The author describes experiments made on various waters, showing the absolute sterilization produced by this gas, and concludes by giving particulars of various ways in which practical use can be made of the discovery acting upon large bodies of water. An appendix gives extracts

¹ Technology Quarterly, Dec., 1898, p. 227.

² Ann. des Travaux publics de Belgique, p. 369, 1898.

from various sources, detailing the effects which impure water has caused in various towns in the dissemination of diseases.

Lead-poisoning from Drinking-water.—Recent investigations of the State Board of Health of Massachusetts¹ show that lead-poisoning has occurred in several small towns and one city of 90,000 inhabitants among persons using the water of the public supply drawn through lead-pipes. In all these instances the water was drawn from the ground, and was not a surface-water; and in most of them a change had been made or a new supply introduced within a few years. There was also an excess of carbonic acid in these waters.

Treatment of the Crude Sewage of London.—In the recent report of Clowes and Houston² to the London County Council the following general conclusions are stated as the result of their experiments: "The above considerations show that neither on chemie, nor possibly on bacteriologic, grounds can any serious objections be raised to the introduction of the effluent from the coke-beds into a portion of the river Thames, which is cut off by locks from the intakes of the water companies, and the water from which is not employed for drinking-purposes, and cannot be used for drinking on account of its "brackish" nature. The effluent certainly will not cause any deposit upon the river-bed, and will even tend to render the turbid water of the lower river more clear and transparent. At the same time the liquid discharged from the out-fall into the river will be sweet and entirely free from smell. Further, it will carry into the river the bacteria necessary for completing its own purification in contact with the aerated river water, and under no conditions can it therefore become foul after it has mingled with the stream. The effluent will in no way interfere with fish-life in the stream."

Advantages of Bacterial over Chemic Treatment.—As compared with the present process of chemic precipitation and sedimentation, the bacterial process presents the following advantages: (a) It requires no chemicals. (b) It produces no offensive sludge, but only a deposit of sand or vegetable tissue which is free from odor. (c) It removes the whole of the suspended matter, instead of only about 80% thereof. (d) It effects the removal of 51.3% of the dissolved oxidizable and putrescible matter, as compared with the removal of 17% only effected by the present chemic treatment. (e) Further, the resultant liquid is entirely free from objectionable smell, and does not become foul when it is kept; it further maintains the life of fish.

The Shone Separation System in Arad, Hungary.—Gärtner³ recently visited Arad, and took this occasion to inspect the Shone system of drainage, introduced in 1885-1896, which has been in successful operation since August, 1896. The town includes a total population of about 50,000 inhabitants, and this system is in use for a thickly populated district comprising 829 houses, occupied by about 20,000 persons in all. The ejector-stations, air-compressors, and pipe-system have been designed for a population of 30,000, with a view to extension. A main sewer, constructed of best stoneware pipes, 21,653 yards in length, with a fall

¹ H. W. Clark, 30, "Report of Mass. State Board of Health," p. 541, 1899.

² Bacterial Treatment of Crude Sewage and Experimental Treatment (intermittent) of London Crude Sewage in the Coke-beds at Crossness, London, 1899.

³ Deutsch Viertelj. f. öfl. Gesundheitspflege, xxx., p. 229, 1898.

varying from 1 in 50 to 1 in 200, with 1600 connections to house-drains, 168 man-holes or lamp-holes, and 41 self-acting flushing tanks, conveys the sewage-water to five of the deepest points selected for ejector-stations. Owing to the sharp fall, and the small diameter of the pipes (the average size being about 7 inches), the sewers are self-cleansing and free from obstructions. No stoppages have at any time occurred. The 5 ejector-stations are sunk in iron-lined shafts from 23 feet to $24\frac{1}{2}$ feet in depth. At each point the ejectors are in duplicate, in case of injuries or stoppages. They vary in size from 250 gallons in capacity down to 100 gallons. The air is compressed from 1.5 to 1.7 atmospheres. The sewage-water, which reaches the ejectors by gravitation, is forced up through rising mains, from 3 inches to 5 inches in diameter, to the irrigation plots, which are very rudely laid out. The total daily working cost, excluding interest and sinking fund on the sum expended on the construction of the works and plant, is 25s. The authorities are satisfied with the system and intend to extend it.

The Water-carriage System in France.—J. Stubben¹ stated that while at the present time about half the sewage of Paris is diverted from the Seine, it is expected that by 1900 all the sewage will be intercepted and utilized on the land now being laid out for irrigation. He declared in favor of extending the area to be used for this purpose, in order to obtain, as far as may be possible, the full manurial value of the sewage-water in the interests of agriculture. On the subject of the separate system of sewerage he reported that this is only practicable in special cases, and that it is one certainly not adapted for Paris. He asserted, moreover, that the adoption of this plan would not decrease the cost of sewage removal to house-owners. His report was adopted by the committee, with only one adverse vote (that of M. Badois), and it was resolved that the conclusions of the Third Congress of House-owners did not merit acceptance, and that the water-carriage system, decreed in accordance with the law of 10th July, 1894, should be maintained, and should be strictly enforced. It was further resolved that the price of water ought to be reduced, the supply of drinking-water increased, and that special provision should be made for the fullest possible use of the sewage-water for irrigation purposes. These resolutions were accepted unanimously by the general meeting of the Society on the 8th of May last, and the author trusts that the completion of the Paris water-carriage system will now be effected without further interruption.

The Removal of House-refuse on the Kinsbruner System.—It has been shown by Walther Häntzschel² that the first step in dealing with domestic refuse consists in the careful sorting of the same, in order to collect the glass, metal, leather, etc., which, when brought together, mixed largely with ashes, may then be either burnt or melted, this latter plan being adopted when the refuse is chiefly the ash of brown coal. Experiments recently conducted in Berlin go to prove that a temperature of about 1800° C. is needed for this process, by which the ashes are converted into a black, treacly mass, which it is proposed to utilize for the manufacture of paving-blocks. The Berlin police regulations make it compulsory to collect the house-refuse without causing dust, and a

¹ Deutsch. Viertelj. f. öffentliche Gesundheitspflege, p. 744, 1898.

² Gesundheits-Ingenieur, 31, p. 329, Oct., 1898.

company has been formed to introduce the Kinsbruner dust-preventing system of removal. By reference to illustrations the details of this plan are set forth. A van of a special type is employed, in which the dust is discharged into receptacles which tip over into the body of the van and are emptied so as to prevent any of the dust from escaping into the street. The entire body of the van can be lifted off the frame and wheels, in order to place the same on railway trucks or to discharge the contents into the holds of the vessels which ply on the river Spree. Special arrangements are also made to prevent any dust from escaping during the emptying or tipping process.

Discharge of Crude Sewage into Tidal Waters.—H. B. Nichols, C. E.,¹ presents a list of places on the coast of England which discharge their sewage into the sea or into tidal rivers, with a brief table stating the method of disposal. He concludes that "only where there is a rapid seaward current is it permissible to discharge crude sewage into tidal waters, and then only in receding tides. Where float experiments over a lengthened period show that there is a likelihood of sewage returning to the point of outlet or being carried on to the foreshore, it is advisable for the sewage to be treated. In the majority of instances clarification is all that is necessary, and this can be accomplished by precipitation in tanks, or on the biologic principle as adopted at Exeter. To ensure perfect immunity from danger, however, the outlets should always be carried to points where the currents tend seaward."

Comparison of Deep Well and Filtered River Waters with Reference to the Prevalence of Typhoid Fever among Consumers.—H. Smee,² medical director of a large life insurance company, publishes an array of figures to show that the people using filtered river water enjoy a much greater immunity from typhoid fever than those who use the water drawn from wells in limestone regions or from swampy districts. The following cities, which draw their water from wells in chalky strata, had a typhoid mortality per million inhabitants in 1896 as follows: Hull, 280; Norwich, 193; Epsom, 190; Portsmouth, 153. Cities taking surface water from mountainous or marshy districts: Belfast, 560; Dublin, 453; Liverpool, 322; Glasgow, 223; Leicester, 203. Cities using filtered river water: Hamburg, 58; Cologne, 49; Frankfurt, 42; Altona, 41. London, which had a mixed supply (filtered river water and wells in chalk), had a typhoid mortality of 137 per million.

The Effect upon Health of Drying the Soil.—Davison³ contributes a paper in which he shows that the public works (drains and sewers) introduced in Buenos Aires about 1874, but not completed till 1896, were followed by a decided reduction in the mortality from consumption and from tetanus. The soil of the city was chiefly of clay and very retentive of moisture. Before the introduction of the drainage-works (1872) the mortality from tuberculosis was 3.3 per 1000 inhabitants, but it gradually diminished to 1.7 in 1897. Tetanus shows similar results, having fallen from the exceedingly high maximum of 3.3 deaths per 1000 in 1873 to a minimum of 0.3 per 1000 annually in

¹ Jour. Sanitary Institute, p. 603, Jan., 1899.

² Brit. Med. Jour., p. 1667, June 25, 1898.

³ Ann. del Departamento Nacional de Hig., viii. 12, 1898, p. 339, Buenos Aires, 1898.

1894-1896, or less than one-tenth of its former intensity. He also shows that there had been an increase in the mortality from acute lung-diseases, from about 1.8 per 1000 in 1870 to about 2.5 per 1000 in 1896, this increase being much less than the decrease in the other two diseases mentioned. Observers in other countries had noted this tendency in pneumonia to increase with the drying of soil.

INDUSTRIAL HYGIENE.

The Departmental Committee appointed to inquire into and report upon certain **miscellaneous dangerous trades** has issued a fourth interim report and a final report.¹ Thorpe and Oliver have also reported upon similar subjects. The fourth report relates to the occupation of grinding, in which the danger results from the bursting of stones. This report also embraces the work of file-cutting, the danger in this occupation being due to lead-poisoning. Littlejohn of Sheffield testified that 91 people had died in that city from lead-poisoning, 56 of whom were file-cutters. Porter of the Royal Infirmary, in referring to the insidious character of the disease, says that specific symptoms of poisoning do not occur usually for 13 or 14 years, and that was the average time between the date of the first exposure to the poison and the first specific symptoms causing them to seek medical advice. In the fifth, or final, report of the Committee, 10 different occupations are included, the most important being those in which danger from lead-poisoning exists. These are the manufacture of metallochrome powder, the use of lead in print-and-dye-works, and the licking of labels in thread-mills. The following sanitary duties are enjoined upon the employers in chrome-works: To provide washing conveniences, including hot and cold water, soap, nail-brushes, and towels. Also respirators and overalls for persons employed in dry processes. Fans and suitable means of ventilation wherever dust is generated. A sufficient supply of Epsom salt for making the following sanitary drink: Magnesium sulphate, 2 oz.; water, 1 gallon; essence of lemon, sufficient to flavor. No food to be eaten in any part of the works. Working-people are also recommended to keep a bit of alum in the mouth during the time of work. The report of Thorpe and Oliver on the prevention of poisoning in pottery manufacture presents briefly the following conclusions: 1. By far the greater amount of earthenware can be glazed without the use of lead. 2. Some branches of the pottery industry would find it difficult to dispense with lead. Here the use of an insoluble silicate is recommended. 3. The use of raw lead for glazing or coloring should be absolutely prohibited. 4. Since it is difficult to provide an innocuous lead-glaze, young persons and women should be excluded from employment, and others should be subjected to systematic medical inspection.

Dangers to the Health of Operatives Engaged in Guncotton Manufacture.—The author, Robert Vogt,² was commissioned to inquire into the injuries caused to the health of the workmen at Wor-

¹ Fourth Interim Report on Certain Dangerous Trades, London, 1899. Final Report on Certain Dangerous Trades, London, 1899. Report on the Employment of Lead-compounds in the Manufacture of Pottery, London, 1899.

² Deutsch. Viertelj. f. öff. Gesundheitspflege, 1898, p. 566.

blauen Gunpowder Works by the processes formerly employed there, as well as by the new process of manufacture, and to suggest any needful remedies. The gun cotton is obtained by treating washed cotton with a mixture of 1 part of highly concentrated nitric acid and 3 parts of equally concentrated sulphuric acid. The manufacturing operations may be considered in 3 stages: (a) Placing the cotton to be nitrified in the acid baths. (b) Removal of the nitrocellulose from the bath and placing the same in the centrifugal wringers for the expulsion of the superfluous acid. (c) Emptying the contents of the wringers and conveyance of the gun cotton to the washing-troughs for the removal of the last traces of acid. It is stated that fumes of nitric acid are copiously evolved, and permeate the whole factory throughout the process. The people engaged in the work are employed for 10 hours daily, and earn good wages. The numbers and ages of the workpeople are enumerated, and it is pointed out that, without exception, they suffer from injuries to their teeth, and later from illnesses attributable to defective mastication. The author asserts that the acid fumes undoubtedly give rise to a form of necrosis of the incisors, allied to the necrosis produced by phosphorus in the case of the match manufacture. The only plan of combating these dangers to health would appear to be the provision of efficient exhaust-ventilation, so as to convey away the acid fumes as perfectly as possible from the vicinity of the vessels from which they are given off. Workers who have lost their teeth should be supplied with artificial ones at the expense of the manufacturers, as the injury is a permanent one, and is caused by the specific processes employed in this industry.

Metal-grinders and Polishers.¹—The chief danger to the workman is dust, and its development should be restricted as much as possible. To effect this, grinding must be done with water. Ventilation is necessary to remove the dust. Even with the most perfect appliances dust will penetrate the grinding-room, and care must be taken to remove it as often and as thoroughly as possible. The grinder must attend to the cleanliness of his room and his person. Baths are recommended. The grinder should be taught to breathe through his nose when working, and stand erect at his work. The use of intoxicants, and especially brandy, should be forbidden. The strict observance of hours of work and of rest is necessary, 10 hours of work being a maximum for men and 8 for boys. Short pauses are desirable to allow workmen to go out to breathe the fresh outdoor air. Grinders' consumption is curable.

Hygienic Regulations for Workers in Compressed Air.—L. Brennecke² gives in full 36 rules drawn up by Richard Heller, Wilhelm Mayer, and Hermann V. Schrotter for the regulation of workers in compressed air, and embodying the results of a long series of experiments conducted by them. Among other points, it is stated that work can be carried on in pressures up to 5 atmospheres. The following tables give the least times which should be taken in "locking" workmen in and out of compressed air:

¹ Zeit. f. Hyg., 31, 2, p. 261.

² Centralbl. d. Bauverwaltung, 1898, p. 305.

"Locking" in—			"Locking" out—		
0.5 atmosphere, not less than	5 minutes.		0.5 atmosphere, not less than	10 minutes.	
1.5 " "	10 "		1.0 " "	20 "	
2.5 atmospheres, " "	15 "		1.5 " "	30 "	
3.5 " "	20 "		2.0 atmospheres, " "	40 "	
			2.5 " "	50 "	
			3.0 " "	60 "	
			3.5 " "	70 "	
			5.0 " "	100 "	

In all cases the reduction of each 0.1 atmosphere pressure should occupy at least 2 minutes.

E. H. Snell¹ attaches more importance to the "*locking-out*" than to the "*locking-in*" process. The workmen should be healthy, selected men, and should be instructed how to inflate the ears, and should not work when there is pain in the ears. The compressed-air chamber should be ventilated and lighted by electricity. The workmen should abstain from alcohol, and should never enter compressed air when under its influence. Disposal of excreta in the chamber should be provided for. A medical air-lock was furnished for re-compression of sick men at the Blackwell Tunnel.

NOXIOUS GASES.

In discussing **acetylene gas from the hygienic point of view**, Joseph Vértess² says that the employment of acetylene is already becoming widespread, and while much has been written concerning its composition, its mode of production, and the burners best adapted for its combustion, little is known with respect to its influence upon health. These facts can be conveniently discussed under 3 heads: (1) Acetylene gas when mingled with the atmosphere; (2) products of combustion in the case of acetylene; and (3) impurities in acetylene. It is pointed out that in consequence of the fact that calcium carbide is hygroscopic, this substance is liable to cause the spontaneous evolution of gas by gradually attracting moisture from the atmosphere. An American physician, Birchmoore, has maintained that even a volume of 0.01% of this gas in the atmosphere produces headache and sickness; but according to Vértess this is a ridiculous exaggeration. Trouvé has asserted that this gas relieves colds and coughs. According to Gréhan, even 20% of this gas in the atmosphere produces no evil effects when breathed by animals; but with 40% the mixture was speedily fatal. He discusses the volume of gas absorbed by water, and calls attention to the fact that acetylene, when it constitutes one-twelfth part of the volume of air with which it is mingled, yields an explosive mixture. Under the second head, after a full consideration of the gases caused by burning pure acetylene, and after comparing them with those obtained by the combustion of common coal-gas, it is affirmed that acetylene under similar conditions, that is to say, with the production of an equal amount of light, vitiates less than one-half the volume of the air that coal-gas does, and gives rise to far fewer products of combustion. An enumeration follows of the impurities likely to be present in acetylene; these are caused by certain substances found in the raw materials used in making the calcium carbide, and they

¹ Compressed-air Illness, or so-called Caisson-disease, London, 1896.

² Gesundheits-Ingenieur, July 31, 1898, p. 225.

consist mainly of phosphorus, sulphur, silicon, and nitrogen compounds. The author maintains that these substances, except perhaps phosphorus, cannot, with common care in the manufacture, exist in sufficient quantities to cause any ill-effects to health.

Danger from Illuminating-gas.—The Departmental Committee appointed to inquire into the manufacture and use of water-gas, etc.,¹ presented its report to Parliament, January, 1899. The evidence presented and published is mainly that of gas-engineers, physicians, and chemists, and much information was obtained from the United States, showing that the mortality from the inhalation of illuminating-gas had increased more than tenfold since the introduction of water-gas in the large cities. The recommendations of the committee were as follows: 1. That it should be illegal for any one to make and distribute for heating and lighting any poisonous gas which does not possess a distinct and pungent smell. 2. Intending gas-producers to state what kind of gas they propose to furnish. 3. Before any kind of water-gas is distributed due public notice should be given; and as long as there is any water-gas in a supply the fact should be stated on every gas-bill. 4. Records to be kept by the producer, showing the amounts of water-gas supplied each day to each district, these records to be open to inspection. 5. Power to be given to a central authority to make regulations limiting the amount of carbonic oxid in the gas supplied to consumers. 6. Further power to be given to the same authority to regulate the distribution and use of gas. 7. Officials to be appointed to test and to publish the quality of the gas supplied to consumers.

The committee further recommends that the verdicts of coroners' inquests in deaths from such causes should be made more explicit and clear for purposes of registration.

The Methods of Estimating the Value of Carbonic-acid Gas.—Gerda Troili-Petersson² makes reference to a previous communication on this subject, in which attention was directed to the mode of employing the Petersson-Palmqvist apparatus, as modified by the author, for experiments in regard to ventilation. Several varieties of similar apparatus, small in size and free from complex parts, have already been introduced, and exception is taken by the author to the statement that the modified form of the above apparatus gave results which were inferior in point of accuracy to that described, for instance, by Bleier. It is shown that the figures relate not as assumed to percentages, but to the parts per 1000, and that while the greatest difference obtained by 2 estimations of the same sample of air by the use of the author's portable apparatus was but 0.07 part per 1000, the original form of the Petersson and Palmqvist portable apparatus gave readings which might vary as much as 0.15 part per 1000. Some later trials conducted by the author with the 2 forms of portable apparatus are described, and in 1 case the air in a dwelling-room was found, after it had been occupied by 1 individual for 9 hours, to contain 0.82 part of carbonic-acid gas per 1000 parts, the initial composition having been 0.65 part per 1000. Some larger subsequent increases were suspected to be due to the escape into the room of the products of combustion in a closed stove. In order to decide this point some tests were made with the stove by closing the valve, when the volume of

¹ London, 1899.

² Zeit. f. Hyg., p. 331, 1898.

carbonic-acid gas in the atmosphere of the room rose rapidly to 1.40 parts per 1000. Attention is directed to the errors likely to be caused in the use of all kinds of apparatus of this nature by variations in temperature, and some observations are given to illustrate this source of inaccuracy. For instance, a set of readings in 2 school-rooms is given in a table showing the volume of carbonic-acid gas present at various short intervals, with the values obtained by the readings of different instruments. In these latter tests the opening of the windows between the lessons and the changes in the temperature induced great differences in the results.

Hygiene of Tenement Houses.—Under the title of “Dwelling Accommodation in Large Cities,” J. F. J. Sykes¹ separates the functions and requirements to be provided for the individual in a modern dwelling as follows :

Purposes.	Provision in a single room.	Provision in separate rooms.
1. Living.	Table and chairs.	Parlor.
2. Sleeping.	Bed.	Bed-room.
3. Food storage.	Cupboard.	Larder.
4. Cooking.	Range.	Kitchen.
5. Warming.	Range.	Kitchen.
6. Ablution.	Draw-tap and sink.	Scullery.
7. Clothes washing.	Wash-tub.	Wash-house with copper.
8. Bathing.	Bath or tub.	Bath-rooms.
9. Deposit of refuse.	Pail.	Bin.
10. Open space for drying clothes, storage of refuse, etc.	Window-sill.	Yard or balcony.
11. Excretion.	Water-closet.	Water-closet.

It is possible to cram all these appliances into a single room except the last. It is at once apparent that the differences of sex and age are the factors which render family life impossible in a single room, and that in the erection of new dwellings for families single-roomed dwellings are out of consideration. We must therefore start with the 2-roomed dwelling, the very minimum family accommodation possible, and it must be recognized that family life entirely carried on in 2 rooms cannot be regarded as a sufficiently high standard of “home” in which the bulk of the young population of the nation should be reared and trained as future citizens, however humble their walk in life. Sykes quotes the following figures from J. B. Russell of Glasgow relative to the percentage of the population living in 1, 2, 3, 4, and 5 or more rooms in that city, and the difference at 2 periods, 1871 and 1891, to which Sykes adds figures for 1 of the most and 1 of the least crowded districts of London :

Dwellings.	Census, 1871.	Census, 1891.	Difference, 1871-1891.	England and Wales.	St. Luke's.	Lewisham.
One room	30.4	18.0	12.4	2.2	21.8	5.2
Two rooms	41.5	47.5	+6.0	8.3	29.9	6.7
Three rooms	13.2	19.7	+6.5	11.1	19.1	9.1
Four rooms	5.8	7.2	+1.4	23.5	9.3	11.0
Five rooms and upward .	9.1	7.6	-1.5	54.9	19.9	68.0

Under the provisions of the Common Lodging-houses Act of 1851, the minimum amount of cubic air-space for each individual has been succe-

¹ Jour. Sanitary Inst., vol. xx., p. 1, 1899.

sively fixed at 240, 260, 280, and 300 cubic feet, at which point it now stands. It is possible that this minimum was a purely mechanical calculation in packing, the physiologic requirements of the human subject being overlooked. The Glasgow and Edinburgh authorities require in 1- and 2-roomed dwellings the provision of 400 cubic feet for adults, and half that amount for children under 10. In barracks 600 feet are provided per head by the army regulation. Many years ago Parkes showed that, calculated on a physiologic basis, the human adult required 1000 cubic feet of air-space, because, in order to maintain the air in a sufficient state of average purity in a dwelling-room, it was necessary to supply 3000 cubic feet of air per hour, and the air in temperate climates could not be changed oftener than 3 times per hour. As an important means of reducing the mortality from infectious diseases, and especially from phthisis, still more rapidly, the author pleads for an increase in the minimum requirement of cubic air-space per individual, and for a legal definition of the term "overcrowding." Further valuable papers on tenement-house improvement are those of P. Addie, entitled "The Removal of Insanitary Areas and the Management of Improvement Schemes under the Housing of the Working-classes Acts."¹ Also the "Necessity of an Amendment to the Housing of the Working-classes Act," by H. Scurfield.²

Railway Sanitation.—A committee³ of the French Society of Public Medicine and Professional Hygiene has reported the following recommendations in regard to the prevention of the spread of disease by means of railway coaches: The posting of notices in the cars and waiting-rooms prohibiting expectoration upon the floors of cars and stations. The placing of cuspidors in the waiting-rooms and corridors. These should not be filled with sand, but with an appropriate liquid. Wiping the floors of cars and stations with moist cloths should be substituted for dry sweeping. Carpets or mats in cars should be made of material which can be readily cleansed. Persons suffering with infectious diseases should not be permitted to ride in the ordinary compartments, but should be placed in a special compartment, in which no one else should be allowed to travel except the necessary attendants. At its destination this compartment should immediately be subjected to disinfection before being used again. Compartments designed for conveying the sick should be so constructed as to admit of disinfection readily.

HYGIENE OF INFANCY.

The Effect of Rest during Pregnancy upon the Infant.—Pinard⁴ presents an array of facts in support of his proposition that women who pass a considerable period in repose before the time of confinement produce larger and better developed children. Briefly stated, his proposition is "that pregnancy is more likely to be of a normal character, and the ovum is more likely to be developed naturally, in so far as the mother is placed during pregnancy in a favorable environment. On the contrary, a woman exposed to fatigue is liable to premature delivery. In support of this proposition he presents the following groups of obser-

¹ Jour. Sanitary Inst., vol. xx., part 1, p. 11.

³ Rev. d'Hyg., May, 1899.

² Ibid., p. 52.

⁴ Ibid., Dec., 1898, p. 1072.

vations upon 4455 pregnancies, part of which were made at the clinic Baudelocque, and a part at the Maternity of Furcoing. In general they demonstrate with mathematical certainty that repose or fatigue during pregnancy has a definite effect on the weight of offspring, and that the weight of a newborn infant of a mother who has been at rest during the 2 or 3 months before delivery is greater by at least 300 grams (about $\frac{2}{3}$ pound) than that of a child whose mother has worked in the upright position up to the day of delivery. The following are the principal figures presented in support of the foregoing statements:

	Mean weight of child in pounds at delivery.	
	Primipare.	Multipare.
Women who had worked in the upright position up to time of delivery	6.45	4.64
Women who had worked upon textile fabrics in upright position	6.57	6.85
Housewives and seamstresses of the maternity	6.67	5.11
Women who had worked in the sitting position up to delivery	6.81	7.27
Sewing-machine workers who had worked up to delivery	6.49	7.04
Women who had been at rest for 2 or 3 months . . .	7.24	7.60
Women who had been at rest for more than 3 months	7.16	7.60
Women who had been at rest, time not stated	7.16	7.60

The mean age of the primipare was about 22 years, and that of the multipare about 27 years. The author sustains the view of Bachimont,¹ who concludes a valuable paper on the same subject in the following language: "From the point of view of humanity, from that of increase of the population, and the evolution of the French race, it is necessary that the public authorities should take action to protect the mother during pregnancy, and the fetus during the last 3 months of intrauterine life."

SCHOOL HYGIENE.

Schäfer² of Strasburg divides the hygienic precautions requisite for the public schools into 2 classes—general and specific; the former dealing generally with the air, soil, and water, by which infection is usually conveyed; and the latter with infectious diseases common among school-children. The precautions necessary to prevent the spread of infection are the immediate recognition of the first case, its isolation and oversight, and the disinfection of the infected articles. Essential regulations in regard to school hygiene are as follows: 1. General school hygiene as a basis of all prophylactic measures. 2. Exclusion of pupils from school. 3. Closing of school. 4. Disinfection. 5. Medical supervision of schools. 6. Criticism of the regulations in force. Under section 3 he presents the following statement with reference to the number of times that schools were closed in Schleswig-Holstein in the 4 years 1879–1882, and the causes for which they were closed:

¹ L'Histoire de la puericulture intrauterine, Paris, 1898.

² Deutsch. Viertelj. f. öff. Gesundheitspflege, 30, 4, p. 617, 1898.

Cause for closing.	Number of closures.	Cases in which schools were closed on account of illness in teacher's family.
Measles	82	18
Scarlet fever	99	23
Diphtheria	52	22
Whooping cough	6	1
Typhoid fever	3	3
Dysentery	1	1

In the case of measles schools occasionally were closed for want of sufficient scholars to attend them. Fizia presents a similar list in support of the foregoing observations. With reference to districts where the faulty custom prevails of housing the teacher's family in the school-house: if the cost of disinfection after convalescence and the loss of instruction borne by the district are considered, the material loss is great. Medical supervision is essential to the physical health of the scholar, even though one is satisfied with a single thorough examination of all the children at the beginning and end of the school year. Constant medical supervision could not be accomplished in small country districts by a single physician. If the duties of a school physician are performed after the manner of Hermann Cohn, a physician would be needed for almost every school. Von Reuss proposes to give the general supervision to a medical officer and the detailed work to ordinary physicians. He deems the teacher's aid most valuable, however, since, like the mother, she will detect illness in the child with whom she has become familiar by constant daily intercourse sooner than the physician, who, under the most favorable circumstances, sees the children only once a day.

MISCELLANEOUS.

Influence of Soil on Earth-burial.¹—The suitability of soil for the site of a cemetery depends on the same conditions that determine its fitness or unfitness for the treatment of sewage, viz., the presence or absence of nitrifying bacteria, its permeability to air, and its humidity and drainage. In the one class of soils bodies undergo desiccation, and the soft parts "return to dust" in the course of a few years; in the other they putrefy and remain for years—in fact, for indefinite periods—fester-ing masses of corruption. The reference gives several instances in sup-port of this statement.

Offensive Trades.—Under the title of "Municipal Authorities and Public Slaughter-houses," E. Parkes² discusses the necessity of better provision for slaughtering animals in England, treating the subject under the following heads: 1. The establishment of public slaughter-houses or halls with all modern appliances. 2. The efficient inspection of meat by qualified persons. 3. Proper facilities for keeping meat. 4. Mode of killing. He shows that Germany is far in advance of England in its provision for slaughtering and meat inspection. The markets in Ger-many generally include market-halls for live cattle, sheep, and pigs; slaughter-halls for the different animals, including one for horses; cold storage, bad-meat destructors, ice-making plant, rooms for tripe-dressing, fat and tallow departments, and inspection departments. They are usually outside the city, where plenty of land can be taken. Birming-

¹ Public Health, July, 1899, p. 684.

² Jour. Sanitary Inst., vol. xx., part 1, p. 23.

ham, England, is now completing a new slaughter-house on modern principles at a cost of £120,000 (\$600,000).

Hygiene of the Bicycle.—Lehrwald¹ says: There are 4 factors in the exertion of wheel-riding: The exertion of strength or force: 1. To overcome friction. 2. In hill-climbing. 3. Overcoming inertia. 4. In resisting wind and air. He who rides for health rides 40 to 50 kilometers (25 to 30 miles) a day, and does not attempt to climb hills having a grade of more than 3%. The cyclist upon level ground² goes 18 times as far as the pedestrian with equal exertion. Championnière³ presents many facts in support of the cure of hernia by means of the regular, judicious use of the wheel. The exercise should be regular, and hill-climbing and fast riding should be forbidden. The saddle should be easy, and the frame adjusted to the rider.⁴

VITAL STATISTICS.

German Kingdom.—Population (1895), 50,929,423.

	Rate.
Living births	1,866,188 36.64 per 1000
Deaths	1,072,514 21.06 " 1000
Deaths under 1 year	370,648 198.6 " 1000 births.
Deaths from certain causes.	
	Rate.
Diphtheria and croup	32,289 6.34
Whooping cough	19,769 3.88
Scarlet fever	8,342 1.64
Measles	13,666 2.68
Typhoid fever	5,792 1.14
Phthisis pulmonalis	109,659 21.53
Pneumonia	67,558 13.27
Diarrheal diseases (including cholera infantum)	133,087 26.14
Puerperal fever and other diseases of childbirth	6,561 1.29
Cancer	34,568 6.79
Suicide	10,484 2.06
Smallpox	10 0.002
Hydrophobia	4 0.001

Italy.—Mortality per million (1887–1897):

YEAR.	Death-rates per 1000.	Smallpox.	Measles.	Scarlet fever.	Typhoid fever.	Diphtheria and croup.	Whooping cough.	Consumption.	Pneumonia.	Cancer.
1887	28.9	550	806	496	942	956	378	1078	2163	428
1888	28.5	610	706	305	804	865	257	1084	2453	425
1889	26.5	449	462	216	772	666	411	1064	2115	433
1890	27.6	233	479	244	669	501	435	1071	2523	430
1891	27.5	96	646	241	635	554	297	1010	2439	433
1892	27.0	48	407	259	513	546	249	1022	2488	429
1893	26.5	86	423	215	492	580	225	977	2501	432
1894	25.3	85	292	146	443	506	268	1022	2540	449
1895	24.7	97	365	123	503	369	280	1024	2588	487
1896	23.7	65	369	104	526	298	213	1068	2517	496
1897	21.6	32	196	124	496	283	253	987	2148	509

¹ Arch. f. Hyg., 32, B. 4, pp. 354, 411.

² Cycliste et bicyclette, Galtier-Boissière, Paris, 1898, p. 142.

³ Bull. de l'Acad. de Méd., Feb. 3, 1899.

⁴ See also La bicyclette ses effets Psycho-physiologiques, for effects of excessive riding on different organs. Guillemet, Paris, 1898.

From the foregoing table it appears that there has been a slight decrease in the mortality from consumption, a marked decrease in that of smallpox, measles, scarlet fever, typhoid fever, and diphtheria, and a slight increase in that of cancer. The decrease in consumption and increase in cancer have in neither instance been so great as that of Northern European countries or the United States.

Vital Statistics of England.—From the advance sheet published by the Registrar-General of England for 1898 the following figures are obtained relating to the vital statistics of England for that year. These figures are usually found to be nearly, but not quite, as accurate as those which are published in the annual volume a year later. Estimated population of England, in the middle of the year 1898, 31,397,078. Marriages, 254,955; marriage-rate per 1000 persons married, 16.24. Births, 922,873; birth-rate, 29.39. Deaths, 552,040; death-rate, 17.58. Ratio of male to female births, 1032 males to 1000 females. Birth-rate of London, 29.4. Death-rate of London, 18.3.

The Increase of Cancer.—R. J. Moore, M. P.,¹ as the result of inquiries among farmers, states that cancer is more common among cattle than tuberculosis, and that the meat of cancerous cattle is generally sold as food; and suggests this as a cause of cancer in man. The *British Medical Journal* answers this statement by a reply from McFadyean, that cancer is much less common in cattle than tuberculosis. He had never seen a case of cancer in the udder of the cow, and thinks the possibility of human beings contracting it by eating the meat of such animals is not worthy of consideration. Williams² attributes the spread of cancer to increase of eating meat. He says meat consumption in England has more than doubled in 50 years, and now amounts to 126 pounds per capita per year. He also attributes the increase to insufficient bodily exercise and insufficient nourishment with fresh vegetables. The death-rate from cancer in 1840 was 177 per million; in 1896, 764 per million population. The mortality of men has increased in England 167%, and that of women 0.91%, from 1851 to 1890.

The sixtieth report of the Registrar-General of England,³ in commenting on the increase of cancer, states that the increase is greater among males than among females. He says the increase in the recorded deaths from this disease is the resultant of 3 factors: 1. Possible changes in the actual mortality from cancer. 2. Improvements in medical diagnosis. 3. A recent system of inquiry respecting deaths certified as due to "tumor." Men are more liable than women to cancer of the larynx, trachea and lungs, mouth, tongue, throat, and esophagus, as well as of the jaw, lips, face and neck, bladder and urethra. Among females the mammae and generative organs are specially liable to cancer. All death certificates from this cause should specifically state the organ affected.

¹ Food and Sanitation, Sept. 30, 1899, p. 473.

² Lancet, July, 1897, p. 50.

³ London, 1899, p. 25.

PHYSIOLOGIC CHEMISTRY.

By WALTER JONES, PH.D., AND REID HUNT, M.D.

OF BALTIMORE, MARYLAND.

Distribution of Urea in the Animal Organism.—Schöndorff¹ gives the results of determinations, made by an original method, of the percentage of urea in the organs of a dog which had been given a meal rich in proteid. The various organs, with the exception of the skeletal muscles, the heart-muscle, and the kidney, were found to contain about the same amount of urea as the blood: viz., about 0.12%. The skeletal muscle contained 0.0884%; since the time of Liebig it has been a matter of doubt whether urea occurred in muscle at all. The amount of urea in the organs of a dog weighing 32 kilos was nearly 17 gm.; the weight of the organs studied made up 53% of the animal's weight. This work has important bearings upon the question of the action of foods, drugs, etc., upon the production of urea; it is by no means easy to determine whether the increased excretion of urea which follows the administration of a drug is due to an increased production of urea or simply to an increased excretion of the urea already present in the body. In a second paper Schöndorff² reports the determinations of urea in a few animal liquids; he finds that the percentage of urea in human milk and in the amniotic liquid is about the same as that of blood; the amount in blood increases as the amount of proteid in the food increases.

Cholesterin of the Blood.—Hürthle showed that cholesterin occurs in blood-plasma in the form of esters of palmitic and oleic acids. Brown³ has found the same to be true of the blood-serum of the hen and other fowls. Hepner⁴ has made a series of experiments to determine in what form the cholesterin of the corpuscles occurs, and finds that it is free; as is also, at times, at least a part of that of the plasma. A few experiments on fasting animals indicated that the amount of cholesterin was independent of the food. Brown also obtained cholesterin crystals directly from the bird's corpuscles by extraction with ether.

Thiocyanic Acid in the Saliva.—Thiocyanic acid is, according to Krüger,⁵ a constant and normal constituent of human saliva; it does

¹ Pflüger's Archiv, lxxiv., p. 307.

² Ibid., lxxiv., p. 357.

³ Amer. Jour. of Physiol., ii., p. 306.

⁴ Pflüger's Archiv, lxxiii., p. 596.

⁵ Zeitschrift f. Biologie, xxxvii., p. 6.

not result from a partial decomposition of the saliva or from carious teeth. The saliva of smokers was found to contain 2 or 3 times as much of the acid as that of nonsmokers. The quantity of saliva secreted in 24 hours (250 to 300 cc.) was not markedly influenced by cigaret smoking.

Iron Absorption.—Hofman¹ reached the conclusion, from microchemic studies of the intestinal walls, that the chief absorption of iron takes place in the duodenum; he believes that inorganic salts of iron are absorbed. A similar result has been reached by Honigman² by chemic methods; the observations were made upon a patient with a fistula in the lower ileum. After the administration of nearly a half gram of ferrum citricum oxidatum in 2 days, only 18% was recovered from the feces voided at the fistula, and practically none from the urine; 0.328 gm. of "inorganic iron" had been absorbed in 2 days. Swirski,³ studying the question in guinea pigs by microchemic methods, believes that iron is absorbed along the entire length of the alimentary tract with the exception of the stomach; it seems probable that some iron is eliminated through the respiratory mucous membrane. Austin,⁴ on the other hand, experimenting on dogs and using quantitative chemic methods, obtained results which he interprets as showing that inorganic iron (ferrous sulphate) is not absorbed; the iron of raw meat was, however, readily absorbed.

Iron in Liver and Spleen in Malaria.—The following table, from analyses of Dutton,⁵ shows how great may be the deposition of iron in the liver and spleen in malaria:

	MILLIGRAMS OF IRON PER 100 GM. OF ORGAN.	
	Liver.	Spleen.
Healthy man (Quinke)	30 to 40	253
Lunatic (Quinke)	81.6	144
Malaria, case 1	208	1135
" case 2	440	1325

Microchemic tests also showed a large amount of iron.

Inorganic Compounds in the Human Fetus.—According to analyses of Hugounenq,⁶ a fully developed fetus contains about 100 gm. of inorganic compounds, but only 0.294 gm. of this is metallic iron. The absorption of inorganic salts, especially of iron, is very great during the last 3 months of fetal life,—much more so than during any previous period,—and the advisability of giving the mother at this time a diet rich in iron is suggested.

Products of Gastric Digestion.—Within the last 4 or 5 years a large number of writings have appeared which describe the attempts made by various experimenters to separate the products of an artificial gastric digestion of proteids. Each experimenter uses a method of separation which produces what are apparently well-characterized products, and which, when applied to the substances obtained by his

¹ Virchow's Archiv, cli., S. 488.

² Ibid., clii., S. 191.

³ Pflüger's Archiv, lxxiv., S. 466.

⁴ Boston Med. and Surg. Jour., cxl., p. 204.

⁵ Jour. of Path. and Bacteriol., v., p. 331.

⁶ Compt. rend., cxxviii., 1054.

predecessors, shows that each of these is capable of being resolved into at least 2 constituents. The object of most of these experiments has been to show the relation that each of these products bears to every other and to the common mother substance, and it seems never to have occurred to one of these experimenters that the mother substances may themselves be very complex mixtures, and that there is, consequently, no direct chemie relation between the products. The latest contribution on the subject is by E. P. Pick,¹ who, by fractional precipitation of Witte's peptone with ammonium sulphate, has obtained what he believes to be 4 well-characterized albumose fractions, and has also isolated 2 peptones from the part of the material which is not capable of forming a precipitate with ammonium sulphate.² There are thus 6 fractions to which the author proposes to devote his attention, and if we are to judge the 5 contributions that are to appear by the first instalment, his work alone will constitute a library on the subject.

The author first investigates the primary products of digestion—the so-called primary albumoses. He claims that the methods hitherto employed for the separation of these substances from each other, and for separating both from the secondary products, are inadequate, since saturation with sodium chlorid always throws out some deuteroproteose, and subsequent dialysis always leaves some heteroproteose in solution. These difficulties were overcome by treating a solution of the protoproteose and heteroproteose with strong alcohol until the solution contains alcohol in such strength as has been determined by numerous experiments to be more than sufficient for completely throwing down heteroproteose and yet is capable of holding all of the protoproteose in solution. He thus obtains two substances which he considers purer than any heteroproteose or protoproteose that has been described. Analysis of the compounds shows that they are both richer in carbon and nitrogen, but poorer in oxygen, than Hammarsten's fibrin; and, in marked contrast to the mother substance, neither product contains any fast-bound sulphur. While in many respects the 2 substances behave very much alike, their decomposition products show that they are very differently constituted. Thus, the heteroproteose contains 39% of its nitrogen in the basic form, while the protoproteose contains only 25%. The protoproteose yields a large quantity of tyrosin by pancreatic digestion, or yields indol and skatol by heating with alkalis, but only a trace of leucin and no glycocoll. The heteroproteose, on the contrary, yields very little tyrosin, indol, or skatol, but a large quantity of leucin and a reasonable amount of glycocoll.

The author's experiments are also in accord with the generally accepted conclusion that the two proteids are formed from fibrin contemporaneously, and not successively.

E. Zunz³ has shown also that by fractional precipitation with zinc sulphate there can be isolated from among the products of gastric digestion of proteids 4 well-defined albumoses. These 4 substances

¹ Zeits. f. physiol. Chem., xxviii., S. 219.

² Ibid., xxiv., 246.

³ Zeits. f. physiol. Chemie, xxvii., S. 219.

not only differ sharply in the limits within which they may be thrown out of a solution in water by the addition of zinc sulphate, but also differ qualitatively in many of their chemie reactions. These 4 fractions are believed by Zanz to be identical with the 4 albumoses that were obtained by Pick by fractionally precipitating with ammonium sulphate.

Protamins.—The researches of Kossel and his co-workers on the protamins and their decomposition products proceed with vigor. The latest addition to this most important group of compounds is a substance called cyclopterin, which Morkowin¹ has obtained from the spermatozoa of cyclopterus lumpus (lump-sucker). This substance responds to Millon's reaction, a property not possessed by the other protamins, and, therefore, in all probability contains the atomic grouping which in the proteids gives rise to tyrosin. Kossel gives an abstract of the results which he has hitherto obtained, together with his views on the relation of the protamins to other proteids, in a speech before the meeting of the British Scientific Association, held in Dover during the summer of 1899. After noting the many points of resemblance between the protamins and the more complex proteids, he says: "Protamins, however, differ from other proteid bodies chiefly in that they present strongly marked basic characteristics and furnish chiefly basic bodies as a result of cleavage: that is, they contain little else than the basic moiety of the complex proteid molecule. We can, therefore, regard the ordinary proteids as bodies having originated by the addition of tyrosin or leucin groups to the original sturin molecule. On the other hand, a preponderance of protamin groups in the proteid molecule will endow it with prominent basic characteristics. We can produce such artificial combinations by adding certain albuminous bodies to protamins in alkaline solution. Under these circumstances compounds are formed which possess the properties of complex proteids, and in which basic characteristics prevail. These artificial substances are identical with certain compounds found in the body, and named histons. These histons are widely distributed in animal cells, and appear to belong chiefly to the cell-nucleus. We can, therefore, consider them as proteid bodies in which the basic moiety of the molecule—the protamin group—outweighs the others. Thus, we see that the proteid molecule must possess duplex properties: on the one hand, it is to be regarded as of an acid, and on the other hand, as of a basic constitution. But it cannot be doubted that, in addition to these two kinds of affinity, the proteid molecule also possesses others, by means of which it is enabled to effect combinations both with organic and inorganic atomic groups. This many-sided property of the proteid molecule is that which enables it to fulfil its widely different physiologic functions in cell-life.

"One may aptly apply to the proteid molecule the Greek description of the Sphinx—the front, a lion; the middle, a dragon; and behind,

¹ Zeits. f. physiol. Chem., xxviii., 313.

a chimera. Lying on the isthmus which divides living nature from the dead, it is waiting for the traveler who will solve its riddle."

It has hitherto been granted that the alkalinity which is necessary for neutralizing the food which passes the pylorus in an acid condition is furnished by the alkaline carbonate present in the bile, the pancreatic juice, and the succus entericus, as well as the basic substances which result from putrefaction in the intestine. That these are not the only sources of the alkalinity necessary for pancreatic digestion is shown by D. Lawrow,¹ who proves that the products of digestion themselves are capable of assisting the **further action of the enzyme**. In a series of tubes is placed a quantity of egg-albumen with active trypsin, and the material in each tube is brought to a different degree of alkalinity by the addition of various quantities of free arginin. After the digestion has proceeded for 12 hours the amount of undigested albumin is determined for each tube. A similar series of experiments is made with the same materials, except that sodium carbonate is used instead of arginin. As a result of the figures thus obtained, it is concluded that the alkalinity due to arginin exercises nearly the same influence upon pancreatic digestion as that due to sodium carbonate.

Physiologic chemists have long been familiar with the fact that only about half of the peptone that is formed by a gastric digestion of proteids may be further decomposed into **amido acids** when submitted to the further action of the proteolytic enzyme of the pancreatic secretion. Upon this phenomenon Kühne, Neumeister, and others have expressed the belief that in the proteid molecule there are two essentially different kinds of groups: the one an antigroup, which gives rise to an anti-series of proteolytic products, ending in antipeptone; and the other a hemigroup, which in like manner gives rise to a corresponding series of hemiproductions. As this theory has been very widely credited, and as it seems to rest almost entirely upon the existence of antipeptone, a great deal of interest will naturally be taken in Kutscher's² discovery that antipeptone, prepared faithfully by the method of Kühne and Chittenden, can be shown to contain lysin, arginin, and histidin. It will be remembered, also, that Siegfried³ has obtained from the milk and from muscles a substance which yields as one of its **hydrolytic products** a sulphur-free compound called carnic acid. As this substance possessed many of the properties of antipeptone, Siegfried prepared several salts of the two compounds, the analyses of which showed that the two bodies have a very similar chemie composition. Carnic acid is a comparatively simple chemie compound, having the formula $C_{10}H_{15}N_3O_5$; and if the identity of this substance with antipeptone could be shown, the proteid would thus be proved to be a body of far less complexity than has been assumed for any proteid. Balke, therefore, attempted to prepare a sulphur-free antipeptone that should show a composition represented by the formula $C_{10}H_{15}N_3O_5$. He was so

¹ Zeits. f. physiol. Chem., xxviii., 303.

² Ibid., xxx., 195.

³ Ibid., xxii., 255.

far successful that he showed the continual decrease of sulphur in the substance as it was submitted to methods of purification; and while he was never able to obtain a substance that is perfectly sulphur-free, both he and Siegfried expressed the belief that the very small amount of persistent sulphur was not a necessary part of the antipeptone molecule, and that **antipeptone and carnic acid must be regarded as identical.**

In his second contribution ¹ Kutscher reports on an examination of some antipeptone which he has prepared by Balke's method, and, like the corresponding substance of Kühne and Chittenden, this also is found to yield histidin and arginin. In the course of this work Kutscher isolated a new base, which he was not at that time able to identify, but which he subsequently showed to be an **optically inactive arginin.**

Siegfried ² describes his attempts to obtain an antipeptone of constant composition by repeated solution of the product in water and precipitation with alcohol. Nevertheless, this is practically the method which was employed in preparing the product which led him to assume the identity of carnic acid with antipeptone. He gives it as his opinion that a pure antipeptone cannot possibly be prepared in this way, and says, rather lightly, that it is not at all surprising that Kutscher's preparation contained so many impurities, especially if we consider the rather large yield that was obtained: 1400 gm. of moist, pressed fibrin gave somewhat more than 200 gm. of antipeptone. Fourteen hundred gm. of moist, pressed fibrin contain about 300 to 350 gm. of dry substance, so that Kutscher obtained considerably more than the theoretic 50% of antipeptone, without taking into consideration the large necessary losses that are to be met with in the manipulation.

Siegfried thus describes a **method of purifying antipeptone** which is somewhat similar to the one he used in connection with phosphocarnic acid: namely, by means of the insolubility of the iron compound. Crude antipeptone was dissolved in water that contained a trace of sulphuric acid, and the solution while hot was saturated with ammonium sulphate. After filtering, the fluid is treated with a solution of iron ammonium alum in saturated ammonium sulphate. Under these conditions the antipeptone is thrown out. The precipitate is suspended in water, dissolved by the careful addition of ammonia, and the sulphuric acid removed from the solution with barium hydroxid. After removing the excess of barium the solution is carefully evaporated to dryness and the residue examined. Its aqueous solution is strongly acid and gives a very intense biuret reaction, but fails entirely to produce the red color with Millon's reagent, even on boiling. Phosphotungstic acid which has been acidified with sulphuric acid produces a precipitate *only with concentrated solutions of the material*, and by boiling with sodium plumbite no brown color is produced. From this material also zinc and barium salts were prepared, which, however, yield analytic results which differ quite widely from the percentages called for by carnic acid.

¹ Zeits. f. physiol. Chem., xxvi., 110.

² Zeits. f. physiol. Chem., xxvii., 335.

Kutscher¹ writes his third contribution with some little fire. He shows that from Balke's antipectone it is possible to obtain histidin, arginin, lysin, and aspartic and glutamic acids. In answer to Siegfried's criticism that his antipectone contained the histon bases as impurities, he states that in his first research he worked exactly according to the method of Kühne and Chittenden. From 388 gm. of albumin one should obtain theoretically 194 gm. of antipectone; but Kühne and Chittenden obtain only 120 gm., or about 62% of the theoretic yield. By the use of this method Kutscher obtained from 213 gm. of albumin 60 gm. of antipectone, or about 57% of the theoretic yield. The method used by Balke would be expected to yield more nearly the theoretic quantity of antipectone, for in this method many operations of the Kühne-Chittenden method are omitted. By this procedure Kutscher obtained 200 gm. of antipectone from 526 gm. of albumin, or about 76% of the theoretic amount. Moreover, in Siegfried's criticism he has not taken proper cognizance of the fact that Kutscher used the entire pancreas in the digestion, and an allowance should be made for the antipectone resulting from the digestion of the proteids of this organ.

It would, therefore, appear that Kutscher has obtained no greater quantities of antipectone from a given weight of proteid than did the experimenters who have proposed the methods by which this antipectone was obtained; and whether his preparations are "pure" or "impure," they are identical with the preparations on which was based the theory of anti-groups and hemigroups in the proteid molecule, as also the identity of antipectone with carnic acid. Kutscher asks with some vigor [and his curiosity is shared, no doubt, by many chemists]: Why should Siegfried seek to prepare purer antipectone if he has already obtained preparations which accord in composition with the formula $C_{10}H_{15}N_3O_5$?

This controversy has been expected since the first paper which Kutscher wrote, and it will not be surprising if other criticisms should follow; if, however, the latter should prove of no more serious character than the one offered by Siegfried, it is safe to say that antipectone will soon be interesting only from a historic point of view.

Glycocoll from Proteid.—It seems, from experiments of Lusk and Parker,² that about 5% of the nitrogen of proteids may be eliminated as glycocoll. Their method consisted in determining the maximum amount of hippuric acid (benzoyl-glycocoll) found in the urine of rabbits after the administration of benzoic acid.

Ferment Action of the Secretion of the Small Intestine.—Krüger,³ in experiments in which bacterial action was carefully excluded, failed to find any action of the extract of the mucous membrane of the small intestine upon proteids or fats; starch was converted into sugar and cane-sugar was inverted. No evidence of reverting properties, as some have claimed to have observed, could be detected. According to Weinland,⁴ there is in the small intestine of sucking animals (including man) a ferment, **lactase**, soluble in water and capable of

¹ Zeits. f. physiol. Chem., xxviii., 88.

² Amer. Jour. of Physiol., ii., p. 14.

³ Zeitschrift f. Biologie, xxxvii., S. 229.

⁴ Ibid., xxxviii., S. 16.

hydrolyzing milk-sugar. This ferment is also found in the adults of some animals, but not in the rabbit; yet if milk is fed to a full-grown rabbit, or even to a hen, for some months, such a ferment is developed in the intestine.

The Suprarenal Glands.—J. J. Abel¹ contributes a most interesting article on the blood-pressure-raising constituent of the suprarenal gland. He shows that the remarkable physiologic effects which are produced by aqueous extracts of the gland are due to an alkaloid of the composition $C_{17}H_{15}NO_4$, to which he gives the name "**epinephrin.**" As this substance has attracted such wide-spread interest among physiologists and medical men, it may be well to state just how the alkaloid has been isolated.

A water extract of the glands of a large number of oxen was treated with benzoyl chlorid and caustic soda. Under these conditions every trace of epinephrin is thrown out of solution as a benzoyl compound, $C_{17}H_{14}NO_4COC_6H_5$. This substance was heated in an autoclave under a pressure of 8 to 10 atmospheres with water alone, or under a much lower pressure with 2% sulphuric acid. Both processes lead equally well to a decomposition of the benzoyl compound, but only by the latter procedure is a product obtained from which physiologically active salts can be prepared. When the autoclave product, after removing the benzoic acid, is carefully neutralized with ammonia, epinephrin itself is precipitated, $C_{17}H_{15}NO_4$. The base was dissolved in very dilute sulphuric acid and precipitated as a picate, $C_{17}H_{15}NO_4 \cdot C_2H_2(NO_3)_3OH$, by the addition of sodium picate. This picate was obtained in crystalline form, and was found not only to be itself ash-free, but also to yield a series of ash-free salts, as the bisulphate, $C_{17}H_{15}NO_4 \cdot H_2SO_4$, the hydrobromate, $C_{17}H_{15}NO_4 \cdot HBr$, and triacetyl epinephrin, $C_{17}H_{12}NO_4(CO.CH_3)_3$.

Epinephrin itself, as precipitated with ammonia, as well as the salts prepared from it, are physiologically inactive. When, however, the autoclave product formed at 3 atmospheres with dilute sulphuric acid is treated with sodium picate (without first isolating the free base), a picate is formed of such activity that 0.0011 gm. injected into the jugular vein of a dog weighing 6850 gm. caused a rise of blood-pressure equal to 46 mm. of mercury. From this active picate an active bisulphate was prepared. The active salts can all be transformed into one another without loss of activity, but whenever the free base is employed as an intermediate product, or whenever an active salt is submitted to a moderate heating, the physiologic properties of the substance are seriously changed. The author calls attention to the fact that in this regard epinephrin does not differ from a number of substances (such as *iso*-amidacetophenone, amidoethylaldehyd, and diamidoacetone) which are very labile, and which, when once liberated from their salts, easily undergo an atomic rearrangement ("Umlagerung").

The alkaloidal character of the substance is very pronounced in its

¹ Zeits. f. physiol. Chem., xxviii., S. 318.

behavior toward general alkaloidal reagents and in its color reactions. Solutions of epinephrin salts yield precipitates with iodine in potassium iodide, potassium cadmium iodide, iodine trichloride, and numerous other reagents, while the substance in most minute quantity produces with sulphuric acid and permanganate, and with Mandelin's reagent, a succession of colors which rival those produced by strychnine under similar conditions.

When epinephrin is treated with dilute alkalis, a volatile substance is formed which possesses the odor of both coniine and piperidine, and on acidifying the products of the reaction there is thrown out a dark brown acid which in many respects behaves like the melanins. In view of the brown pigmentation which accompanies Addison's disease the production of a pigment-like substance from epinephrin is rather striking.

As epinephrin yields skatol and pyrrole, forms an osazone, and yields several pyrocatechin reactions, the author cautiously suggests the

formula $\text{C}_6\text{H}_4 \begin{array}{c} \text{C.CH}_3 \\ \diagup \quad \diagdown \\ \text{C} \end{array} \text{C.CH(OH).CO.C}_6\text{H}_3(\text{OH})_2$ as one which is at least in con-

formity with the large amount of chemie evidence which he has brought forward.

The results of a number of experiments on the pharmacologic action of the substance may be summarized in the statement that epinephrin is a poisonous alkaloid which paralyzes the respiratory center, and, in the case of warm-blooded animals, the heart as well.

O. von Fürth¹ has formally concluded, from what appears to be insufficient evidence, that the physiologically active constituent of the suprarenal body is either tetrahydrodioxypyridine or dihydrodioxypyridine. As von Fürth's article appeared before the one which has just been described, it is useless to abstract his conclusions until he has had an opportunity to reply.

The **xanthin bases** of the suprarenal gland have occupied the attention of J. Okerblom.² From 300 to 500 gm. of the fresh gland are washed out with water, and after coagulating the proteids, the fluid is evaporated in a vacuum at 35° to 40° C. A light gray crystalline powder finally separates, which was submitted to analysis for xanthin bodies by the scheme of Krüger and Solomon.³ It was found that the principal part of the material is xanthin, but 1-methylxanthin, hypoxanthin, epignanine, and adenine were also shown to be present. Although the search for uric acid and guanin gave negative results, it is quite possible that both of these substances may be found if larger quantities of material are used.

"Animal vs. Vegetable Ferments."—Austin⁴ finds that taka-diaxase has a greater power of converting starches than either saliva or pancreatin; it also, apparently, carries the process further, forming dextrose instead of maltose. In a second paper on "Starch Digestion

¹ Zeit. f. physiol. Chemie, xxvi., S. 15.

² Ibid., xxviii., S. 60.

³ Ibid., xxvi., S. 354.

⁴ Boston Med. and Surg. Jour., cxxxix., p. 567.

in the Stomach”¹ the same author states that the action of taka-diastase is accelerated by small amounts of free hydrochloric and organic acids; large amounts of the former retard the action. As, however, albuminous foods unite with the hydrochloric acid, and this combined acid does not retard the action of taka-diastase, the latter may exert its action in the stomach after an ordinary meal. Experiments² on man show that the same holds true for the saliva in the stomach; hence “the impression held by many that the diastase of saliva becomes nonactive 15 or 20 minutes after eating is totally erroneous.” Rachford,³ in a study on the “Diastatic Action of Pancreatic Juice,” finds that hydrochloric acid in combination with proteids slightly increases the action of this ferment also; sodium carbonate has a very destructive influence. Bile has, of itself, some diastatic power; moreover, it diminishes the unfavorable action of both hydrochloric acid and sodium carbonate. Thus, it seems probable that bile may play a part in the intestinal digestion of starches.

Chemistry of Wallerian Degeneration.—From chemic examination of the healthy and degenerated sides of the spinal cord, Mott and Barratt⁴ conclude that in the degeneration process lecithin is largely replaced by ordinary fat. The degenerated side was very deficient in phosphorus and was watery.

Analysis of the Ossified Spines in “Entèqué.”—Porcher⁵ has made a chemic examination of the hard spines occurring in the lungs of animals which had died of the curious South American disease known as “entèqué,” and finds that their composition is practically the same as that of ordinary compact bone; histologic examination had already suggested that the tissue was really bone.

Formation of Fat in Phosphorus-poisoning.—Voit’s view that the fat found in the liver and other organs after phosphorus-poisoning is formed from proteid has, perhaps, been generally accepted. Athanasii,⁶ after very careful experiments upon frogs, reaches the conclusion that phosphorus does not cause an increase in the total fat of the body, the increased amount in the liver being due to the transportation of fat from other organs. No evidence was found for the view that phosphorus alters the proteid metabolism; the glycogen, especially that of the liver, was, however, markedly decreased. Experiments carried on by Taylor⁷ in this country simultaneously with those of Athanasii gave the same negative results as regards the formation of fat from proteid. That phosphorus does not act as a direct destroyer of proteid seems to follow from the experiments of Ray, McDermott, and Lusk.⁸ These investigators found that the great decomposition of proteid caused by phloridzin was not increased by the administration of phosphorus, as would be expected if phosphorus destroyed the proteid *per se*. These

¹ Ibid., cxi., p. 325.

³ Amer. Jour. Physiol., ii., p. 483.

⁵ Bull. de la Soc. chim. de Paris, xxi., p. 248.

⁶ Pflüger’s Archiv, lxxiv., p. 511.

² Ibid., cxi., p. 630.

⁴ Jour. of Physiol., xxiv., p. 3.

⁷ Jour. Exp. Med., iv., p. 399.

⁸ Amer. Jour. of Physiol., iii., p. 139.

writers believe, however, contrary to Athanasiu, that in simple phosphorus-poisoning there is an increased decomposition of proteid, "due to perverted metabolism." Their experiments throw no light on the question whether fat itself is formed from proteids.

Action of Arsenic on Bone-marrow and Blood.—Stockman and Greig¹ failed to find any increase in the number of red corpuscles and the amount of hemoglobin in healthy animals after the prolonged administration of arsenic; in fact, it seems impossible to increase the number of red corpuscles above a certain limit by any means except breathing the rarefied air of mountainous regions. The bone-marrow, however, showed clear signs of stimulation, being much more vascular. This stimulation of the marrow may account for the increase of the corpuscles in some cases of pernicious anemia after the use of arsenic.

Solution of Mercury in the Body-juices.—A. S. Chittenden² finds, by injecting mercury in a finely divided state into the circulation, that mercury is found in the urine, but not in the feces; metallic mercury can, therefore, be dissolved by the body-juices when it is introduced directly into the circulation by a method which entirely excludes the presence of a soluble salt of the metal. [Chittenden points out that mercury present in the feces as sulphid would not have been detected by the method used.]

A simple, very delicate test for bromin in the urine is described by Jolles.³ The bromin is set free by sulphuric acid and potassium permanganate, and the resulting vapor is allowed to act upon a strip of filter-paper moistened with p-dimethylphenylenediamin.

Sodium Chlorid and Proteid Metabolism.—Small doses of sodium chlorid have, according to Straub,⁴ no effect upon proteid metabolism; with larger doses (12 to 20 gm.) there was a slight fall, followed by a slight rise, of proteid katabolism. The salt was excreted almost quantitatively the day it was given. Thus, the observations of some of the older writers that sodium chlorid markedly affects proteid metabolism were not confirmed.

Absorption of Iodin by the Skin and Its Accumulation in Certain Organs.—Contrary to the generally accepted views, Gallard⁵ believes, from experiments on rabbits, that the healthy skin is able to absorb aqueous solutions of salts of iodine. The iodine was found to accumulate in certain organs, especially in the brain and glands; perhaps there is some relation between the large amounts of phosphorus and nuclein in these organs and the accumulation in them of the iodine. Diet plays an important part in the elimination of iodine; changes from the ordinary vegetable diet to a dry, starchy one produced a marked increase in the amount of iodine eliminated.

Organic Iodin in the Tissues after the Administration of Potassium Iodid.—In experiments upon hens Levene⁶ found iodine in organic combination only in the fat of the bones after feeding potas-

¹ Jour. of Physiol., xxiii., p. 376.

² Centralt. f. innere Med., xix., S. 568.

³ Compt. rend., cxxviii., p. 1117.

⁴ Amer. Jour. of Physiol., ii., p. 7.

⁵ Zeit. f. Biologie, xxxvii., S. 527.

⁶ Amer. Jour. of Physiol., ii., p. 15.

sium iodid. It seems from this and other work that only a limited number of tissues—certain keratins (hair), certain proteids (thyroid), and certain fats—are capable of combining with iodine in the organism.

Phloridzin and Milk-Secretion.—Cremer¹ found no increase in the amount of sugar in the milk of a cow after subcutaneous injection of phloridzin, as was claimed by Cornevin to occur; on the contrary, there was a decrease in both the amount of milk and sugar contained in it, although the percentage of sugar was slightly increased. The decrease in the amount of milk is attributed by the author to the loss of sugar in the urine: in other words, the cow no longer received sufficient food. Cremer discusses the various views as to the nature of phloridzin diabetes, and adheres to the theory of v. Mering that it is due to an injury or change in the epithelial cells of the kidney, as a consequence of which the sugar of the blood is enabled to escape.

Chemistry of Pigments.—H. Landolt² contributes an article on the choroidal melanin. He finds that the pigment obtained from the tissues by purely mechanical or very mild chemie processes is quite different in composition from the material which is obtained from the tissues after submitting them to a strong digestion with pepsin hydrochloric acid. This is very interesting, but scarcely adds anything to what we already know of these substances; in fact, Ninecki was unable to prepare substances of the same composition in certain instances by using what is apparently the same method of procedure in each case. Landolt finds that the granules of the choroidal pigment, when analyzed intact, have so small a quantity of iron that we must conclude that this element is more accidental than essential to the pigment. He is unable to show the presence of a stroma, as was done by Abel and Davis,³ with the pigment of the negro's skin. Very strangely, the author finds 10% nitrogen in the product which Hirschfeld⁴ isolated from the choroidal pigment by melting with caustic alkalies, and which has always been interesting as an instance of a nitrogen-free melanin.

The differences in chemie composition which exist between melanins of different origin and between melanins of the same origin when slightly different processes of isolation have been employed, have been remarked as very curious by all who have ever worked upon the subject. It can hardly be a question of analytic accuracy, for no one has ever failed to encounter this lack of analytic concordance. W. Jones⁵ attempts to find how far the alteration in chemie composition of a pigment can change by continued treatment with chemie reagents. A quantity of black hair from a horse's tail is allowed to stand during the summer months in contact with an excess of concentrated hydrochloric acid—a method of treatment which offers a fair opportunity for any change that the pigment can undergo in acid solution. The product is washed and dried with alcohol, and ether, and next submitted to the

¹ Zeitschrift f. Biologie, xxxvii., p. 59.

² Zeit. f. physiol. Chemie, xxviii., S. 192.

³ Jour. Exp. Medicine, i., p. 361.

⁴ Zeit. f. physiol. Chemie, xiii., S. 407.

⁵ Amer. Jour. Physiol., ii., p. 380.

action of melted alkalis. A substance was thus obtained which, neither in its physical properties nor in its chemie reactions, could be distinguished from the bodies regarded as melaninic acid, with the exception that it contains no sulphur. While the analysis of the compound does not accord with the composition represented by any simple formula, the product was subsequently mildly manipulated without undergoing any change in chemie composition.

When this pigment is oxidized in alkaline solution, it is easily and completely changed to water, carbon dioxid, and ammonia; but when oxidized with chlorin in acid solution, there was formed a basic substance and a new melaninic acid which accords in composition with a comparatively simple formula and contains a far greater amount of oxygen than any melanin hitherto prepared. The basic substance is volatile, unites easily with acids, has a characteristic odor resembling putrescin, and forms a benzoyl compound with benzoyl chlorid and caustic soda. The base, however, cannot be putrescin, for it easily decomposes when submitted to distillation with alkalis. The production of such a substance as a decomposition product of the melanins is interesting in connection with the fact that ornithin (of proteid origin) yields putrescin as a decomposition product. This observation is a part of a large amount of evidence to show that the melanins are closely related to the proteids.

This chemie relation between proteids and dark pigments is again brought out by Chittenden and Albro.¹ Hemipectone and antialbumid are purified and analyzed. Each preparation is then boiled with acid for varying periods, so that a series of preparations is obtained from each of the proteids. From each product the artificial melanin is isolated and analyzed. These melanins are dark pigments possessing the physical and chemie properties of the natural brown pigments, and each product shows a composition which is closer to that of the proteid or to that of a melanin according as it has resulted from the proteid by boiling for a shorter or a longer space of time.

Urinalysis.—Buchner² describes the methods of urinalysis in use in his laboratory. Several tests for albumin were always used; accurate results with the heat-test were obtained in many cases only when sodium chlorid solution was added. Maly's method was preferred for determining the acidity. (The more recent literature on this vexed question and recent methods are discussed by Malfatti³ and Stern⁴.) If the chlorids are present in the urine in normal amount, and if abnormal constituents are absent, or are present in known quantity, then about one-half of the solids consists of urea; fairly accurate conclusions as to the extent of proteid metabolism can be obtained by this simple rule, provided the composition of the food is known. Uric acid was seldom found in abnormal quantity, even when sediments of uric acid or of urates were present; factors other than the amount of acid present

¹ *Ibid.*, ii., p. 291.

² *Münch. med. Wochenschrift*, xlv., S. 749 und 784.

³ *Centralbl. f. Harn- u. Sexual-Organen*, ix., S. 634.

⁴ *Med. Record*, liv., p. 613.

determined the extent to which these sediments were formed. Concentrated urines and urine rich in formed elements were found to be strongly reducing although no sugar was present. Acetone was frequently found in the urines examined; when it occurs in the urine of pregnant women, it is said to be a sure sign of the death of the fetus, as acetone appears when there is a rapid decomposition of proteid. The paper contains numerous other points of interest and practical value.

Ogden¹ describes the methods of urinalysis in use at the St. Lawrence State Hospital; the paper gives a summary of the various methods found to be accurate and easy of application. Many valuable suggestions concerning the chemic examination of the urine and other animal liquids are contained in a general paper by Chittenden² on the "Relation of Chemistry to Practical Medicine." The various precautions which must be taken when sugar is sought for in the urine by means of Trömmer's test are discussed by Malfatti³ in a general article, which contains, however, many original suggestions.

Alloxur Bodies.—Richardson⁴ describes a method for the determination of uric acid which he claims to be simpler than others in use and just as accurate. After many determinations the author has failed to find any relation between the **xanthin bases and mental diseases**, nor could he verify Rachford's results in epilepsy. In two cases of *tabes dorsalis* excessive amounts of these bases were found, but in general he thinks they are not of much pathologic importance.

Uric Acid Solvents.—Tunnicliffe and Rosenheim⁵ find that piperidin urate is very soluble in water. Ten or 11 grains of piperidin will keep in solution all the uric acid secreted in a day; more than double this amount may safely be taken in a day. These writers recommend doses of 10 grains of the tartrate 3 times a day. Piperidin is, in their judgment, more efficient as a solvent of uric acid gravel than other remedies hitherto used. Weiss⁶ recommends, in cases of uric acid diathesis, quinic acid (best in the form of "urosin" tablets of Zimmer & Co.). From experiments in which thymus was fed, he found that this drug limited the formation of uric, but increased that of hippuric acid. As uric acid requires 14,000 parts of cold water to dissolve it, while hippuric acid dissolves in 600 parts, the advantage of the change is obvious.

Uric Acid and the Acidity of Urine.—The tendency of some urines to deposit uric acid is not always due, according to Jerome,⁷ either to a high degree of acidity or to a high percentage of uric acid; these conditions may favor the deposition, but the real cause of it is obscure. The ingestion of a sufficient quantity of food rich in nuclein (thymus of calf) will cause the urine of healthy persons to deposit uric acid. The studies of Hopkins and Hope⁸ indicate that perhaps

¹Amer. Jour. of Insanity, lv., p. 425.

²N. Y. Med. Jour., lxxviii., p. 943.

³Centralbl. f. Harn- u. Sexual-organe, ix., S. 541.

⁴Jour. Amer. Med. Assoc., xxxi., p. 17.

⁵Lancet, 1898, ii., p. 198.

⁶Berl. klin. Wochens., xxxvi., p. 296.

⁷Jour. of Physiol., xxiii., p. 315.

⁸Ibid., xxiii., p. 271.

it is not the nuclein that causes the presence of uric acid, but some more soluble constituent of such a diet, which acts either as a direct precursor of that portion of the uric acid bearing a more immediate relation to the food, or as a factor in some synthetic process by which uric acid is formed. These authors prepared from the thymus extracts which contained only traces of nuclein and nucleic acid, but their ingestion caused a large increase in the excretion of uric acid.

Formation of Uric Acid by Oxidation of Xanthin (Spitzer¹).—If air is simply passed through solutions of xanthin, no uric acid is formed; if, however, extracts of the liver or spleen are present, then uric acid is formed from xanthin.

Relation of Carbon to Nitrogen in the Urine.—The relation of carbon to nitrogen in the urine is high (0.7 to 0.9), while that of the carbon to the nitrogen in urea—the chief solid—is low (0.43). Pregl² thinks the high ratio is due largely to the occurrence in normal human urine of large quantities (up to 6 gm. of the barium salt a day) of oxypoteic acid, a body which has been isolated but very recently, and in which the ratio of carbon to nitrogen is very high—about 2.6.

Tests for Albumin.—Garratt³ has tested the efficiency of 5 common reagents used for the detection of albumin in urine. In 50 cases of slight albuminuria Millard's reagent gave positive results in 48, Robert's in 43, potassium ferrocyanid in 36, nitric acid in 30, and heat in 26. All these reagents gave tests with blood-serum in dilutions of 1 : 320; with dilutions of 1 : 640 only Millard's reagent reacted. The latter also reacted with solutions of 1 : 1280, and is considered by the author to be superior to the others mentioned. Cannmidge,⁴ while recognizing the great delicacy of Millard's reagent, considers it an awkward liquid to work with; he prefers salicylsulphonic acid to all other tests. This reagent is cleanly, fairly cheap, and certain; it may be carried about as a solid and applied to the urine direct, without heating or any special apparatus. Colquhoun,⁵ on the other hand, considers a solution of carbolic acid in alcohol to be the most convenient test.

Pentosuria.—E. Salkowski⁶ reports the results of his work on the pentoses in the urine. Owing to the rare occurrence of pentosuria, he was unable to obtain sufficient urine containing pentoses, and was, therefore, compelled to use for some experiments normal urine to which a known quantity of xylose had been added. The detection of xylose in the urine offers difficulties which are quite similar to those met with in the case of dextrose, for it is probable that many normal urines contain traces of this or some similar carbohydrate, so that one is constantly in danger either of using too sensitive a test or, on the other hand, of failing to find an appreciable quantity. In addition to the fact that from the wide distribution of the pentoses among food-stuffs one might expect traces of these substances normally in the

¹ Pflüger's Archiv, lxxvi., S. 192.

³ N. Y. Med. Jour., lxxviii., p. 80.

⁵ Ibid., 1899, i., p. 1221.

² Pflüger's Archiv, lxxv., p. 87.

⁴ Lancet, 1899, i., p. 1085.

⁶ Zeit. f. physiol. Chem., xxvii., S. 507.

urine. Elstein has found that of 22 normal urines tested, 14 responded to Jollin's phloroglucin reaction. Salkowski finds, however, that normal urine never responds to the phloroglucin reaction when it is performed as follows: A small amount of phloroglucin is dissolved by warming in 7 to 8 cc. of hydrochloric acid, of density 1.12. To one-half of the solution (after cooling) one adds 10 or 11 drops of the urine to be tested, and to the other half, the same quantity of normal urine. The two tubes are then placed in a beaker of water, which is brought to the boiling-point. The pentose urine will soon take on a red color, while the check test will generally show no color at all, and never a red color. The red solution will show the characteristic absorption-band in the solar spectrum between D and E.

In connection with the test, the following observations are to be noted: (a) A 0.5% solution of glycuronic acid will respond to the test quite as well as a pentose. (b) The same remark holds good also for urochloralate of sodium and phenylglycuronic acid. (c) After the use of menthol or chloral, the urine responds quite well to this test. (d) Small quantities of proteids do not interfere with the test. (e) When the urine to be tested is dark in color, it is permissible to decolorize, either with lead acetate or animal charcoal. (f) The test has the great disadvantage that it is given also by dextrose and milk-sugar.

The **orcin reaction** is much preferred to the one just given, since it is given neither by grape-sugar nor milk-sugar, nor is the test, when carefully carried out, likely to be produced by sodium urochloralate or the substances which are present in the urine after the use of chloral. The test should be performed as follows: A portion of the urine in question is heated with an equal volume of fuming hydrochloric acid and a trace of orcin. As soon as a green color is observed, the solution is cooled and shaken with amyl alcohol. The amyl alcohol takes on a green color, and when examined spectroscopically, shows the characteristic band between C and D, and, in addition, a more uncertain band, more toward the red.

The **demonstration of xylose** when dextrose is also suspected is best made by use of the osazone. Salkowski found that the two osazones may easily be separated by virtue of the greater solubility of xylosazone in water. After the second crystallization two osazones were obtained from a mixture of dextrose and xylose, one of which melted at 203° F. and the other at 165° F.

In dealing with the pentoses in the urine, as with dextrose, it is best not to depend upon any one test.

Sugar in Diabetic Urine.—It sometimes happens, when the sugar of the urine is estimated by the polarimeter and also by Fehling's solution, that there is a difference in the results by the two methods. This difference is due, according to Patein and Dufou,¹ to the presence of levorotatory compounds, which are precipitated by mercuric nitrate in acid solution, but not by basic lead acetate; hence, these authors prefer

¹ Compt. rend., cxxviii., p. 375.

to precipitate the proteids with a solution of mercuric nitrate, followed by an excess of sodium hydroxid, instead of with lead acetate. When this is done, and the filtrate is again tested by Fehling's solution and the polarimeter, the results are found to agree very closely.

A New Saccharimeter.—Lohnstein¹ describes a modified form of the saccharimeter, used in the fermentation test for sugar in the urine; some of the errors connected with the use of Einhorn's saccharimeter are avoided—notably those connected with the absorption of the gas by the liquid and the comparatively large amount of yeast employed. For details the original (with illustration) must be consulted.

Alcaptonuria.—Garrod² describes a very simple method for extracting homogentisinic acid from alcapton in the urine. He heats the urine to nearly the boiling-point, adds solid lead acetate, and filters. The filtrate is set aside in a cool place for 24 hours; the homogentisinic acid appears as crystals of the lead salt; the acid can be freed by hydrogen sulphid. The yield of lead homogentisinat by this method is considerably greater than that obtained by the Wolkow and Baumann process. One hundred cc. of one of the urines examined yielded 0.54 gm. of the lead salt; in another, the yield was 0.29 gm.

Indican in the Urine.—Two years ago E. Wang³ proposed a method for the quantitative estimation of indican in the urine, in which the urine is oxidized to indigo with Obermayer's reagent and the latter titrated with potassium permanganate. Wang has since found that this method may, under certain conditions, yield results which are too high, and proposes the following modification⁴: The urine is first precipitated with a 20% solution of neutral lead acetate, and the filtrate is shaken in separating funnel with an equal volume of Obermayer's reagent and a sufficient quantity of chloroform to dissolve the indigo-blue. After distilling off the chloroform the residue is washed out with a mixture of equal volumes of ether, water, and alcohol, and again taken up in chloroform. After filtration the chloroform is evaporated, the residue taken up in concentrated sulphuric acid, and, after standing an hour, it is diluted with water and titrated with a standard permanganate solution, as in the older method. The method as described is said by Wang to yield very fair results, but it is claimed by J. Bouma⁵ that the method cannot always be depended on.

Chlorin, Iodin, and Phosphorus in Organic Combination in the Urine.—Some time ago Vitali pointed out that the ordinary test for chlorids in the urine (silver nitrate) is not entirely accurate, as "a small amount of chlorin exists in the urine in the form of an unknown organic compound." It has been stated that after the administration of potassium iodid some of the iodine is found in the urine as an organic compound; Vitali⁶ has confirmed this observation, but believes that the iodine is excreted as alkali iodids, which undergo decomposition in

¹ Berl. klin. Woch., xxxv., S. 866.

² Jour. of Physiol., xxiii., p. 513.

³ Zeits. f. physiol. Chemie, xxv., S. 406.

⁴ Ibid., xxvii., S. 135.

⁵ Ibid., xxvii., S. 348.

⁶ L'Orosi, xxi., p. 145; Jour. Chem. Soc., lxxv., ii., p. 116.

the urine, with the formation of organic compounds of iodine. Iodine in organic combination was obtained by adding potassium iodide directly to the urine. Oertel¹ has found that if the total phosphorus in the 24 hours' urine amounts to 2 gm., 0.05 gm. occurs in the form of organic compounds; this amount varies with the nitrogenous metabolism, but is not affected by muscular work.

Bilirubin in the Urine.—A. Jolles² proposes the following method for the quantitative determination of bilirubin in the urine. In support of its accuracy he gives the results of the application of the method to various urines to which a known quantity of bilirubin has been added. The method is founded on the principle that by the action of an alcoholic solution of iodine, bilirubin is converted into a green pigment, the reaction involving 2 atoms of iodine for each molecule of bilirubin. A brief description of the method is as follows: From 10 to 20 cc. of urine (according to the quantity of gall-pigment that is suspected) are placed in a separating funnel with 10 cc. of a 10% barium chloride solution and 50 cc. of dilute hydrochloric acid, and the mixture is shaken successively following the addition of small quantities of chloroform. The united chloroform extracts are shaken twice with 30 cc. of hydrochloric acid (1:1), and to the chloroform solution are added 10 cc. of a $\frac{n}{100}$ Hübe's³ iodine solution. After shaking the two fluids together for about 5 minutes, 5 cc. of a 10% solution of potassium iodide, 5 cc. of a freshly prepared starch solution, and about 100 cc. of water are added; after mixing the fluids thoroughly the excess of iodine is titrated back with $\frac{n}{100}$ solution of sodium thiosulphate, the end of the titration being indicated by the disappearance of all color from the aqueous fluid which stands above the chloroform. As one equivalent of sodium thiosulphate corresponds to 2 equivalents of iodine, which also corresponds to 1 equivalent of bilirubin, the calculation is obvious by which the amount of bilirubin present can be found when the quantities of iodine and thiosulphate that have been employed are known. The entire operation requires about 1 to 1½ hours.

Excretion of Cynurenic Acid.—Although kynurenic acid does not occur in the urine of man, even in wasting diseases, it is a body of much physiologic interest. Mendel and Jackson⁴ have shown that it is a direct product of proteid metabolism; its occurrence in the urine of the dog after accelerated proteid metabolism (however this is produced) suggests the presence of quinolin-like radicals in the proteid molecule. Gelatin does not give rise to kynurenic acid in metabolism, acting, in this respect, like carbohydrates.

Oxybutyric Acid and Coma Diabeticum.—Magnus-Levy⁵ con-

¹ Zeits. f. physiol. Chemie, xxvi., p. 123.

² Zeits. f. physiol. Chem., xxvii., 83.

³ 0.64 gm. of iodine and 0.8 gm. of mercuric chloride are each dissolved in 250 cc. of pure 95% alcohol and the two solutions united. The fluid should be used only after it has stood for 10 hours, and its titrating value should be ascertained anew for each determination.

⁴ Amer. Jour. of Physiol., ii., p. 1.

⁵ Archiv f. exper. Path. u. Pharmacol., xlii., p. 149.

tributes an elaborate article on this subject. In all severe cases of diabetes oxybutyric acid is found in the urine, frequently to the extent of 20 to 30 gm. a day. In diabetic coma, however, the amount may rise to 160 gm. a day, but only in those cases in which sufficient alkali has not been given to bind the acid; otherwise the acid is found in the various organs. Expressed in grams to the kilo of body-weight, the amount of acid present in diabetic coma is sufficient to poison a rabbit. The author considers that diabetic coma is due to acid poisoning. To counteract the effect of this acid, enormous doses of sodium carbonate (hundreds of grams) are necessary. Accompanying this increased formation of acid, and dependent upon it, there is, according to Gerhardt and Schlesinger,¹ an increased excretion of calcium and magnesium; the larger part of the calcium appears in the urine, whereas in health it appears in the feces.

Influence of Carbon Dioxid and of Alkali on the Bactericidal Properties of the Blood.—Hamburger² finds that CO_2 increases the bactericidal powers of the blood. The cause of this is threefold: (1) under the influence of CO_2 the corpuscles take up more water, rendering the serum more concentrated; (2) the CO_2 itself possesses bactericidal properties; (3) the CO_2 increases the amount of diffusible alkalies in the serum, these coming partly from the corpuscles, partly from the albuminates of the serum. For similar reasons the serum of venous blood possesses more bactericidal power than that of arterial blood.

Modifications of Metabolism Produced by Diphtheria-toxin.—Noël Paton, Dunlop, and Macadam³ found that in the fever caused by the injection of diphtheria-toxin the proteid metabolism was much increased; the increased amount of nitrogen in the urine was probably in the form of purin bases—creatinin, etc. The amount of sulphur (in the form of "neutral sulphur") was increased. The proportion of phosphoric acid to the nitrogen was much diminished; the excretion of chlorin was markedly lessened, especially in proportion to the amount of sodium and potassium.

Glycosuria in Diphtheria.—Hibbard and Morrissey⁴ examined the urine in a large number of cases of diphtheria, and found a transitory glycosuria frequently in the severe, and usually in the fatal, cases; this glycosuria was often associated with albuminuria. Injection of diphtheria-antitoxin was occasionally followed by a slight glycosuria.

Chemistry of Toxins and Antitoxins.—The view of Behring that the antagonism between toxins and antitoxins is a chemie one receives support from the experiments of Martin and Cherry⁵ with the toxins and antitoxins of snake-poison and of diphtheria. If the snake-poison and the antitoxin are mixed and allowed to stand for some time in a test-tube, and the mixture is heated to 68° (which destroys the antitoxin, but not the toxin), the solution will be found to be innocuous—

¹ *Ibid.*, xlii., p. 83.

³ *Jour. of Physiol.*, xxiv., p. 331.

² *Virchow's Archiv*, clvi., p. 329.

⁴ *Jour. exp. Med.*, iv., p. 137.

⁵ *Proc. Roy. Soc.*, lxiii., p. 420.

indicating that the toxin has been destroyed. Considerable time (more than 10 minutes) is necessary for the reaction; it was the neglect of the time element that led Calmette to opposite conclusions in similar experiments. Diphtheria-antitoxin will not pass through a gelatin filter, while the toxin will, and the two substances can be separated in this manner. If the toxin and antitoxin are allowed to stand together for some time (2 hours), and the mixture is then filtered, the filtrate is found to be free from toxin—positive proof that the toxin is neutralized *in vitro*.

Herter and Wakeman¹ found that after experimental double **nephrectomy** in dogs the alkalinity, the percentage of urea, the alcoholic and etheral extractives, the fibrin (but not the total proteids), the phosphoric acid, and the potassium salts of the blood were increased. The percentage of sodium was normal; the few observations on uric acid indicated that this substance was present in about the normal amount.

Chlorin and Neurin in the Intestine after Its Complete Obstruction.—The experiments of Nesbitt² show that highly poisonous substances may arise in the intestine during its occlusion. Yolk of egg was given to dogs and the intestine was closed; 2 or 3 days later, when the dogs were killed, cholin, neurin, and a ptomain of uncertain composition were separated from the intestinal contents. The cholin and neurin probably came from the lecithin of the food.

Action of Hepatic, Renal, and Other Cells on Phenol and Indol.—Herter and Wakeman³ find that indol and phenol, when brought into contact with the finely divided liver and other organs of a recently killed rabbit, rapidly disappear. The liver showed the greatest activity; then followed kidney, muscle, brain, and blood. Boiling the liver repeatedly and treatment with mercuric chlorid, sulphuric acid, etc., did not greatly impair the action of that organ; hence, it is not probable that the action is due to a ferment. Perhaps the phenol enters into a loose chemie combination with the cell-substance. Prolonged anesthesia with ether or chloroform lessened the activity of the liver; experiments with other drugs and observations on pathologic conditions did not give very definite results.

Formation of Organic Compounds of Phosphorus.—According to Zadik,⁴ phosphorus must be supplied to the animal organism in the form of organic compounds: the cells are not able to form such compounds from inorganic phosphates.

Assimilation of Carbohydrates in Diabetes Mellitus.—In most cases of diabetes mellitus the body has the power of utilizing a certain amount of carbohydrates; there are, however, according to Rumpf,⁵ cases in which the body loses entirely, either temporarily or permanently, this power. In these cases the carbohydrates do not spare the proteids, and should be entirely avoided.

¹ Jour. exp. Med., iv., p. 117.

² Jour. exp. Med., iv., p. 1.

³ Jour. exp. Med., iv., p. 307.

⁴ Pflüger's Archiv, lxxvii., p. 1.

⁵ Berl. klin. Wochens., xxxv., S. 945.

Conversion of Liver-glycogen into Dextrose.—Noël Paton ¹ does not accept the view that the amylolytic ferment which can be extracted from the liver and other organs with alcohol converts the liver-glycogen into sugar, for he finds that in several particulars the action of the postmortem liver differs from that of this ferment. The blood and kidney, moreover, contain as much of this ferment as, and sometimes more than, does the liver, and yet their power of converting glycogen into sugar is much less than that of the liver.

Chlorid Metabolism in Pneumonia.—Hutchinson ² found in some cases of pneumonia a total disappearance of the chlorids of the urine; rarely did the average excretion exceed 2 gm. of sodium chlorid a day. No definite relation between the degree of fever and the extent of this diminution of the chlorids could be found. As croupous pneumonia is the only pulmonary disease in which any considerable diminution of chlorids occurs, an examination of the urine may prove of great value in differentiating pneumonia from other pulmonary diseases; the test is of less value in diagnosing pneumonia from other fevers, as the chlorids are diminished in typhus, acute rheumatism, etc. If, however, abundant chlorids are present in a case of high fever, the case is almost certainly not one of pneumonia. In malaria the chlorids are increased in the febrile period. A day or two after the crisis in pneumonia an excessive excretion of the chlorids begins.

Metabolism in Leukemia.—Magnus-Levy ³ found that large quantities of urine—often excessively rich in uric acid—were excreted in acute leukemia; the loss of nitrogen sometimes amounted to 21 gm. a day. There was a great loss of body-weight. In chronic leukemia, on the other hand, the nitrogen excreted was often equaled by that taken in as food, and uric acid was not excreted in such large amounts. No constant relation could be found between the amount of uric acid excreted and the number of leukocytes in the blood. Severe hemorrhages caused a great increase in the breaking-up of the proteids (as occurs in experiments on animals). The excretion of phosphorus was greatly increased; the ratio of phosphorus to nitrogen became 1:2.8 instead of 1:6.8, as normally. As there was no increase in the excretion of calcium, neither blood nor bone is the probable source of this phosphorus; it probably came from nucleins and lecithin. Uric acid was found in the blood of 4 of the 5 cases studied. White and Hopkins ⁴ also found no definite relation between the number of leukocytes and the excretion of alloxur bodies and phosphoric acid in a case of leukemia; the excretion of uric acid was somewhat high in proportion to the total nitrogen, but showed no degree of proportion to the high grade of leukocytosis present.

Examination of the Urine by Determination of Freezing-point (Bouchard ⁵).—Normal urine freezes at about 1.35° C., indicating a mean molecular weight of 62 or 63; the extremes in health seem

¹ Jour. of Physiol., xxiv., p. 36.

² Jour. of Pathol. and Bacteriol., v., p. 406.

³ Virchow's Archiv, clii., p. 107.

⁴ Jour. of Physiol., xxiv., p. 42.

⁵ Compt. rend., exxviii., p. 34.

to be from 60 to 68. In pathologic conditions the mean molecular weight may vary from 68 to 112 ; sometimes the high value indicates the presence of diseases—such as syphilis—which otherwise might be overlooked.

Decomposition Caused by Bacteria in Culture-mediums.—Stewart ¹ has applied one of the newer physical chemie methods (the electric conductivity method) to the determination of the amount of decomposition produced in culture-mediums by, and hence the rate of growth of, bacteria ; he suggests that this method may, when more fully developed, be of use in differentiating closely allied forms.

¹ Jour. Exp. Med., iv., p. 235.

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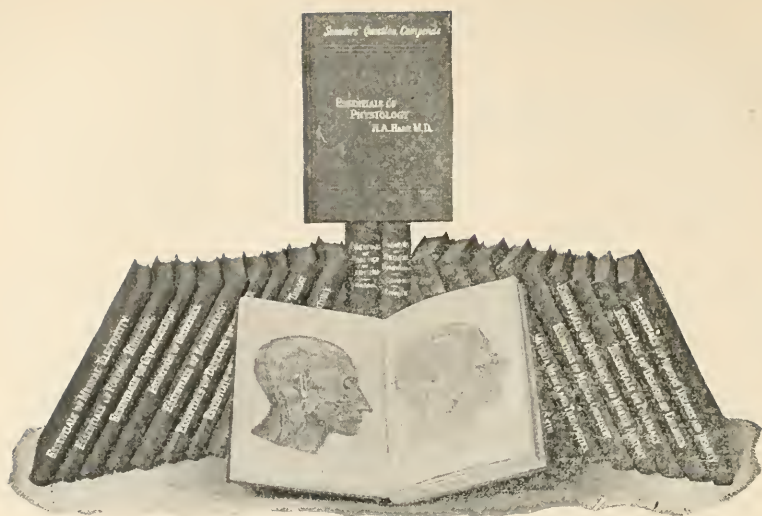
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